



STATE OF SINGAPORE

# REPORT OF THE MINISTRY OF HEALTH

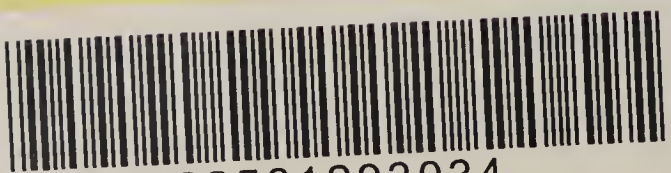
for the year ended 31st December, 1964

BY THE ACTING PERMANENT SECRETARY/DIRECTOR OF  
MEDICAL SERVICES.

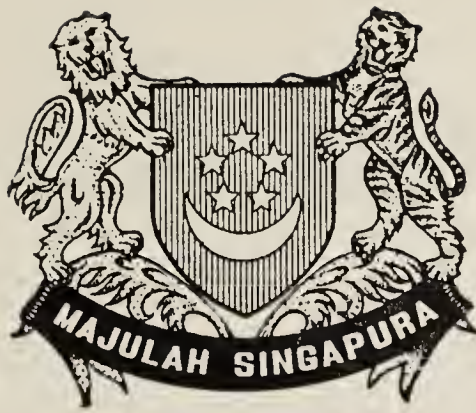


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REPORT OF THE  
MINISTRY OF HEALTH

for the year ended 31st December, 1964

BY THE ACTING PERMANENT SECRETARY/DIRECTOR OF  
MEDICAL SERVICES.

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## INTRODUCTION

The Honourable Mr. Yong Nyuk Lin,  
Minster for Health,  
Singapore.

Sir,

I have the honour to submit the Annual Report of the Ministry of Health for the year ended 31st December, 1964.

2. The general health of the people continue to improve, with the crude birth rate continued to fall to 32.0 while the crude death rate remained at 5.7 as for 1963.

3. During the year there were two outbreaks of riots the like of which had not occurred in Singapore for a very long time. The first riot broke out in the late evening of July the 14th and soon brought a flood of victims to the Casualty Department of the General Hospital. Notwithstanding this flood of victims and the difficulties arising from the imposition of curfew, I was proud to report that we were able to cope with it and also at the same time to keep the emergency services going thanks to the dedication to work and a sense of duty of the staff manning these services. The second riot occurred in September but the casualties were on a smaller scale.

4. During the periods of the curfew, emergency public health measures were instituted. The majority of the staff in the Public Health Division rose to the occasion and kept the essential services going. There were no outbreaks of epidemic diseases, though there was an unavoidable increase in fly and mosquito nuisances which were brought quickly under control when normal public health services resumed after the curfews. I regret to report that during the second riot a Public Cleansing worker lost his life.

### MAJOR EVENTS OF THE YEAR

#### (a) *Public Health Division*

(i) *Spring Cleaning Campaign*—The Minister initiated a Spring Cleaning Campaign from 1st February to 31st May, 1964. This was a qualified success with the City looking brighter and cleaner after the Campaign.

(ii) *Public Health Advisory Board*—This Board was formed after the Spring Cleaning Campaign to formulate more effective and practical measures for the preservation and maintenance of the highest possible public health standards.

(iii) The nuisances arising from cattle wandering on public roads and on public and private property in the City were brought under control with the enactment of the Cattle Ordinance during the year.

(iv) There were three outbreaks of El Tor Cholera. With intensive work and investigations carried out by the staff in the Public Health Division, they were brought under control.



(v) "Indigenous" malaria made its appearance after a break of 7 years, at Fuyong Estate off 9 m.s. Bukit Timah Road in August and September. This was brought under control by emergency measures using intensive mass drug prophylaxis and anti-adult measures. Approximately 6,300 persons in the affected areas were given prophylactic drug treatment. A more detailed description is given under Health Division Section II.

*(b) Hospitals Division*

(i) The reorganisation of the Outpatient services was effected smoothly as from 1st August, 1964. This reorganisation was a decentralisation of the Outpatient services in General Hospital to bring about a more even spread of patients to each of the Outpatient Dispensaries established all over the island and to establish Emergency and Consultation Clinics at the General and the Kandang Kerbau Maternity Hospitals.

(ii) The introduction of charges for deliveries of babies at the Kandang Kerbau Maternity Hospital, at the rate of \$10 for mothers who were Singapore citizens and \$50 for mothers who were non-Singapore citizens.

(iii) The holding of an Orthopædic Conference from 6th to 8th June, 1964 which was attended by surgeons from India, Ceylon, Pakistan, Burma, Japan, Hongkong, New Zealand and Australia. This conference was successful and it was hoped to hold a second conference in August 1966.

(iv) The holding of a symposium on Cancer of the Nasopharynx from 1st to 7th August, 1964. The symposium was organised by the Committee on Geographic Pathology of the International Union against Cancer (the Union International Centre le Cancer). This is the first U.I.C.C. Conference held in South East Asia and was attended by scientific workers locally as well as from India, Thailand, Taiwan, Japan, Australia, U.S.A. including Hawaii, Kenya and the United Kingdom.

(v) The holding of a World Health Organisation Multiple Seminar on Radiological Health from 27th to 28th October, 1964. This was the second in the series of W.H.O. Seminars on this subject, the first of which was held in the Eastern Mediterranean in 1962.

(vi) The holding of two successful exhibitions. The first was held from 6th to 12th April, 1964 in connection with World Health Day and the theme was "No Truce for Tuberculosis". The second was held from 6th to 11th June, 1964 and the theme was to show progress of Pharmacy in Singapore. Both exhibitions were held at the Victoria Memorial Hall.

I have the honour to be,

Sir,

Your obedient servant,

DR. NG SEE YOOK,

*Acting Permanent Secretary (Health)/Director of Medical Services,*



SECTION I  
GENERAL



## 1. LEGISLATION

THE Registration of Dentists (Amendment) Ordinance (No. 14 of 1964) was passed and came into force on 4th December, 1964. It provided for a representative of dentists in Division II of the Register practising in the State of Singapore, nominated by the Singapore Chinese Dentists' Association, to be appointed as a Member of the Dental Board by the Minister.

The Sale of Food and Drugs (Amendment) Ordinance (No. 8 of 1964). This Ordinance makes two amendments to section 28 of the Ordinance of 1955. The first amendment enables the Minister to prescribe fines not exceeding \$1,000 instead of \$500 (as provided for previously) for a breach of the Food and Drugs Regulations. The second amendment provides for the regulations made under the Ordinance to be presented as soon as possible after publication without the necessity of the regulations being approved by a resolution of the Legislative Assembly before they come into force.

The Cattle Ordinance (No. 15 of 1964). This Ordinance was enacted to deal effectively with the problem of stray cattle causing public health problems, traffic obstructions and public nuisances which had remained unchecked for a number of years.

### SUBSIDIARY LEGISLATION

The Nurses Registration (Amendment) Regulations, 1964. These Regulations set out the composition of the Nursing Board and provided for the Minister to appoint certain members of the Board and to revoke their appointments without assigning any reason therefor.

## 2. STAFF WELFARE — DAILY RATED EMPLOYEES

DURING 1964 the Labour and Welfare Unit of the Public Health Division in the Ministry of Health continued to carry out the same function of duties as in the previous two years.

The head of this unit was designated as Senior Executive Officer (Labour and Welfare). He also noted as Chairman of the First Departmental Works Committee, working in liaison with the Ministries of Education, Culture, Social Affairs and Labour.

The strength of the staff of the Labour and Welfare Unit remained the same as the previous year although the volume of work involved had not been reduced. In fact, during the year there had been increase in disciplinary cases in respect of daily rated employees.

The former Senior Executive Officer (Labour and Welfare), Mr. R. Ramalingam, retired from the service in April 1964, and Mr. Wilfred Chew Keng Yong is now carrying out the duties in an acting capacity.

As a result of the issue of Treasury Circular No. 25/64 dated 24th October, 1964 the Labour and Welfare Unit was reorganised into two separate sections, known as the Personnel (Labour) Unit and the Welfare Unit. Henceforth, Personnel Officers will be responsible in all labour matters (except matters pertaining to welfare) connected with daily rated employees, and their duties shall normally include:

- (a) application of the labour legislation and other regulations governing daily rated employees in their departments;
- (b) assisting in the efficient recruitment, transfer, trade test and promotion of daily rated employees;
- (c) assisting in the investigation of grievances and disciplinary matters concerning daily rated employees;
- (d) advise on personnel and industrial relations matters.

The Welfare Officer of this unit will be responsible for all welfare matters pertaining to daily rated employees and his duties shall normally include:

- (a) payment of retirement benefits;
- (b) passage and other repatriation arrangements;
- (c) funeral arrangements and expenses;
- (d) unclaimed wages;
- (e) problems of absenteeism;
- (f) overstay on leave;
- (g) indebtedness;
- (h) hospitalisation;
- (i) matters relating to daily rated porters;
- (j) other general personal and welfare problems of daily rated employees.



The Interim Report of the Commission of Enquiry on Government Daily Rated Employees was published during the year, and action was taken to implement the various recommendations submitted in the report on instructions from Treasury (Establishment).

*Establishment of daily-rated employees*

There are eleven departments under Public Health Division employing approximately 5,000 daily-rated employees. They are as follows:

Cleansing (City)	Quarantine and Epidemiology
Serangoon District	Public Health Engineering
Katong District	Cemeteries and Crematoria
Bukit Panjang District	Southern Islands and Unit
Markets and Hawkers	Transport Centre
Anti-Mosquito	

During 1964 a total of 170 daily-rated employees were recruited for these departments. A total of 58 employees had left the service for the following reasons:

Resignation	...	15
Retirement	...	10
Dismissal	...	20
Death	...	6
Vacation of service under Section 55 of Code of Wages	...	7

*Quarters*—The Federation Union has been pressing for consideration to be given by Government for more quarters to be built for daily rated employees. On the recommendation of the Commission that the Government should set up the necessary machinery to process current and future needs of quarters, a Working Party had been set up to look into the matter.

*Labourers' Co-operative Society*—The strength of the members has increased from 220 to 323 in 1964 and which has contributed to the increasing on the savings in investments. The Society has invested about \$58,500 in guilt-edged security bonds.

A summary of the financial position of the Society is given here below:

FINANCIAL SUMMARY OF GOVERNMENT HEALTH DEPARTMENT,  
LABOURERS' CO-OPERATIVE SOCIETY LIMITED FOR  
THE YEAR ENDED 31ST DECEMBER, 1964

		\$	c.
Post Office Savings Bank	...	5,575	53
Cash at Bank	...	2,051	74
Cash in transit	...	6,346	36
Investments	...	58,530	75
Outstanding loans	...	12,096	50
Total	..	84,699	88
Membership	...		323
Total staff eligible for membership	...		1,400



### 3. STAFF AND TRAINING

#### MEDICAL OFFICERS

THE 1964 Estimates provided for 453 doctors (64 specialist medical posts, 69 posts of senior registrar, 320 posts of medical officers) besides 55 posts of housemen. As at 31st December, 1964, only 43 specialist medical posts and 47 posts of senior registrars were substantively filled, whilst there were 260 medical officers and 46 housemen. There were therefore 97 unfilled vacancies at the end of the year under review.

During the year 45 medical staff resigned as against 65 recruited. 20 Medical Officers proceeded overseas on Study Awards. Four Medical Officers returned after successfully completing their courses of study. 73 doctors graduated from the Faculty of Medicine, University of Singapore and 129 students were accepted for Medicine by the faculty during the year.

Under the Colombo Plan lecturers from Australia and New Zealand were made available for the conduct of a preparatory study course at the University of Singapore for candidates to sit for the primary (written part) M.R.A.C.P. Examination. One serving officer was successful in the Examination and was subsequently awarded a Colombo Plan Fellowship to prepare for the Final Examination in Australia.

#### DENTAL OFFICERS

THE 1964 Estimates provided for 59 Dental Officers (4 specialist posts (including Assistant Director of Medical Services (Dental)), two senior registrars, one Inspecting Officer and 52 dental officers). As at 31st December, 1964, 55 posts were filled.

During the year four resigned as against 15 (including 8 housemen) recruited. One Dental Officer proceeded on a Study Award. One Dental Officer returned after successfully completing his course of study. Nine Dental Surgeons graduated from the Faculty of Medicine and 38 students were accepted for Dentistry during the year.

#### NURSING PERSONNEL

Of the total number of 3,845 staff provided in the 1964 Estimates in the Nursing Service, 3,371 were filled as in December 1964 leaving 474 vacancies.

During the year 184 staff nurses and male nurses, 93 staff midwives and 168 assistant nurses were appointed to the service; and 255 student nurses, 143 pupil assistant nurses, 45 pupil assistant nurses (Psychiatric) and 98 pupil midwives were recruited for training.

During the year 73 staff nurses including male nurses and 17 assistant nurses resigned from the service and 99 student nurses, 34 pupil assistant nurses, and 45 pupil midwives resigned from their training.

There were 737 students in General Nursing Training at General Hospital at the end of the year.

The 3rd In-Service Pædiatric Training Course commenced in October 1963 with one Sister and ten Staff Nurses. The course would end in March 1965.

Six candidates successfully completed the 2nd Operation Theatre Course. The third course commenced on 15th November, 1964 with four Sisters and two Staff Nurses.

The 1st Ward Administration Course commenced in January 1964 and completed in December 1964. 11 Sisters and one Charge Nurse attended the course of whom nine were successful.

Under Psychiatric Nursing Training conducted at Woodbridge Hospital, 3 categories of training namely, Basic, Post Basic and Assistant Nurse (Psychiatric) are provided. There were 185 trainees at the end of the year.

A total of 132 Midwives qualified after training at the Kandang Kerbau Hospital. There were 232 Pupil Midwives under training at the end of the year.

Nine candidates completed their Post Basic Thoracic Nursing Training at Tan Tock Seng Hospital in May 1964.

The 6th Post Basic Public Health Nursing Course was held in the Institute of Health with 16 candidates including one from Thailand.

Table 1

## THE MEDICAL REGISTER (31ST DECEMBER, 1964)

			REGISTERED						
			<i>Doctors</i>	<i>Dentists</i>	<i>Female Nurses</i>	<i>Male Nurses</i>	<i>Asst. Nurses</i>	<i>Mid-wives</i>	<i>Pharmacists</i>
			(a)	(b)	(c)	(c)	(c)	(d)	(e)
Government Medical Department	..	..	363	55	987	268	576	821	28
University (Teaching Staff)			63	14	—	—	—	—	4
Private Practice and Private Institutions	..	..	463	265*	563	37	90	536	73
Housemen	..	..	46	—	—	—	—	—	—
Total			935	334	1,550	305	666	1,357	105

\*46 Division I Dentists.  
219 Division II Dentists.

- (a) The Medical Registration Ordinance (Chapter 191).
- (b) The Registration of Dentists Ordinance (Chapter 197).
- (c) The Nurses Registration Ordinance (Chapter 194).
- (d) The Midwives Ordinance (Chapter 192).
- (e) The Registration of Pharmacists Ordinance (Chapter 198).



# 4. FINANCE

The receipts and expenditure of this Ministry for the year under review is set out in table 2.

Table 2

## MINISTRY OF HEALTH SINGAPORE FINANCIAL STATEMENT FOR THE YEAR 1964

		Receipts		Payments	
		\$	c.	\$	c.
<i>CLASS I</i>					
A1	Contribution and Fines under W. & O. Pension Ordinance	1,699	91	..	3,122,212 13
A2	Penalties and Fines .. .. .	12,942	08	..	25,053,476 03
B3	(4) Professional and Practising Registration Fees:—Medical, Dentist, Pharmacist, Nurses, Midwives .. .. .	14,074	00	..	6,443,336 66
<i>CLASS II</i>					
A1	Rent—Government Building, Quarters, Market Stalls .. .. .	820,219	30	..	427,326 70
A3	(1) Chemistry Analysis Fees for P.U.B. .. .. .				35,046,351 52
(2)	Pathology—Laboratory Fees for Statutory Bodies .. .. .	73,048	00		
		60,329	00		
A4	Other Sales and Non-Regulatory Charges:	133,377	00	..	364,959 14
(6)	Health Division: Commission of Fish Sales, Trade Refuse Removal Fees and Nightsoil Removal Fees etc. .. .. .	2,267,131	66	..	9,775,783 20
(7)	Hospitals Division: Hospital Charges: Sales of Swills Out-patient Charges .. .. .	1,656,463	96	..	16,503,535 28
(20)	Miscellaneous Receipts .. .. .	26,545	77	..	50,690 48
(21)	Search Fees .. .. .	11,129	00	..	26,694,968 10
(22)	Sales of Stores .. .. .	27,661	26	..	
A5	Regulatory Charges to Enterprises:	119,958	00	..	122,780 09
(2)	Chemistry Department Fees .. .. .	1,148,075	82	..	350,571 44
(5)	Licences—Health Division .. .. .	3,908	40	..	550,981 35
(19)	Miscellaneous .. .. .			..	3,555 50
A6	Regulatory Charges to Households:	85,104	28	..	1,027,888 38
(1)	Health: Anti Mosquito Oiling Charges Interment, Crematoria .. .. .			..	
B2	Reimbursement for Services:	131,276	63	..	304,911 72
(11)	Electricity and Water Charges .. .. .	8,419	06	..	1,454,570 40
(12)	Miscellaneous .. .. .			..	403,573 28
<i>CLASS III</i>					
A4	Interest .. .. .	148	24	..	23,478 50
C1	Government's Contribution Paid to C.P.F. .. .. .	4,600	65	..	
C2	Overpayments and Refunds of .. .. .	3,565	56	..	
	Balance borne by Public Revenue .. .. .	58,479,441	32	..	2,186,533 90
		64,955,741	90		64,955,741 90

GENERAL 1964

## 5. VITAL STATISTICS

THE Vital Statistics relating to population, its main racial components, birth and deaths and migration by sea and air during 1964 are set out in the following tables from 3 to 20.

TABLE 3  
POPULATION OF SINGAPORE, 1911 TO 1964

Year	Total	Malays	Chinese	Indians and Pakis- tanis	Eura- sians	Euro- peans	Others
1911 (Census) ..	303,321	41,806	219,577	27,755	4,671	5,711	3,801
1921 (Census) ..	418,358	53,595	315,151	32,314	5,436	6,145	5,717
1931 (Census) ..	557,745	65,014	418,640	50,811	6,903	8,082	8,295
1947 (Census) ..	938,144	113,803	729,473	68,967	9,110	9,279	7,512
1957 (Census) ..	1,445,929	197,059	1,090,596	124,084	11,382	10,826	11,982
1958 (Mid-Year)	1,514,000	207,300	1,141,800	129,500	11,700	11,400	12,300
1959 (Mid-Year)	1,579,600	217,400	1,190,000	134,600	12,000	12,200	13,400
1960 (Mid-Year)	1,634,100	227,300	1,230,700	137,800	12,200	12,700	13,400
1961 (Mid-Year)	1,687,300	236,400	1,269,100	141,500	12,800	13,400	14,100
1962 (Mid-Year)	1,732,800	243,400	1,302,500	143,700	13,700	14,300	15,200
1963 (Mid-Year)	1,775,200	249,200	1,334,500	146,100	14,400	15,000	16,000
1964 (Mid-Year)	1,820,000	257,800	1,366,500	149,900	14,400	15,100	16,300

The racial group 'Malays' includes Indonesians.

TABLE 4  
POPULATION ESTIMATES OF SINGAPORE BY RACIAL GROUP AND  
SEX, 1964

Period	Total	Malays	Chinese	Indians and Pakis- tanis	Eura- sians	Euro- peans	Others
	(In Thousands)						
30th June, 1964							
Males ..	944.9	132.6	690.8	96.2	7.7	8.5	9.1
Females ..	875.1	125.2	675.7	53.7	6.7	6.6	7.2
Total ..	1,820.0	257.8	1,366.5	149.9	14.4	15.1	16.3
31st December, 1964							
Males ..	957.4	135.0	699.0	97.4	7.9	8.7	9.4
Females ..	886.8	127.4	684.0	54.7	6.8	6.7	7.2
Total ..	1,844.2	262.4	1,383.0	152.1	14.7	15.4	16.6

Notes: (i) The racial group 'Malays' includes Indonesians.  
(ii) The population estimates *exclude* non-locally domiciled Services personnel (including United Kingdom based civilians employed by the Services) and their families — 27,299.  
(iii) Transients afloat — 3,466.



TABLE 5  
LIVE-BIRTHS WHICH OCCURRED IN 1964  
BY RACIAL GROUP AND AGE OF MOTHER AND BY SEX OF CHILD

Mother's Age in Years	TOTAL			MALAYS		CHINESE		INDIANS AND PAKISTANIS		EURA- SIANS		EURO- PEANS		OTHERS	
	M. and F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
14 ..	15	8	7	1	..	5	5	2	2	..	..	..	..	..	..
15 ..	35	18	17	9	3	2	1	7	12	..	1	..	..	..	..
16 ..	268	129	139	49	58	54	47	23	34	2	..	..	..	1	..
17 ..	653	346	307	139	122	148	120	58	62	..	2	..	..	1	1
18 ..	1,086	543	543	191	209	270	246	77	83	1	2	..	..	4	3
19 ..	1,237	618	619	200	218	340	311	77	83	1	4	..	1	..	2
20 ..	2,110	1,071	1,039	307	303	637	623	115	101	3	5	2	..	7	7
21 ..	2,284	1,185	1,099	318	295	740	694	122	99	2	4	1	3	2	4
22 ..	2,846	1,486	1,360	349	338	981	867	130	133	13	8	7	7	6	7
23 ..	3,709	1,907	1,802	411	370	1,310	1,261	162	152	9	5	4	3	11	11
24 ..	4,254	2,163	2,091	425	405	1,526	1,507	182	148	9	8	5	7	16	16
25 ..	4,100	2,116	1,984	436	364	1,510	1,443	138	143	13	13	10	3	9	18
26 ..	3,817	1,938	1,879	342	328	1,442	1,401	115	121	15	5	13	10	11	14
27 ..	3,203	1,642	1,561	329	318	1,174	1,074	108	139	13	10	6	8	12	12
28 ..	3,607	1,877	1,730	370	373	1,342	1,208	124	122	15	10	14	9	12	8
29 ..	3,325	1,743	1,582	314	308	1,305	1,158	96	100	11	6	9	7	8	3
30 ..	3,333	1,663	1,670	354	347	1,191	1,196	94	94	6	14	7	9	11	10
31 ..	2,295	1,166	1,129	193	191	890	850	67	66	4	7	4	11	8	4
32 ..	2,492	1,283	1,209	247	224	942	889	71	73	11	7	4	8	8	8
33 ..	2,076	1,062	1,014	163	183	802	749	77	62	8	7	8	4	4	9
34 ..	2,070	1,074	996	176	184	830	742	50	58	7	3	5	3	6	6
35 ..	1,897	960	937	187	184	694	698	64	48	5	2	4	1	6	4
36 ..	1,560	784	776	154	125	583	605	36	31	3	4	2	2	6	9
37 ..	1,357	731	626	119	100	572	484	27	35	6	..	4	5	3	2
38 ..	1,146	575	571	87	102	450	430	33	32	1	2	3	2	1	3
39 ..	806	433	373	63	55	338	298	27	13	4	2	..	1	1	4
40 ..	802	417	385	53	74	347	295	11	11	..	2	3	2	3	1
41 ..	553	287	266	47	29	229	222	9	12	1	1	1	2	..	..
42 ..	416	211	205	28	30	179	167	2	6	..	1	1	..	1	1
43 ..	333	157	176	11	23	143	140	1	9	..	1	1	2	1	1
44 ..	228	114	114	11	13	98	96	5	3	..	1	..	..	..	1
45 ..	140	64	76	5	16	57	58	2	2	..	..	..	..	..	..
Over 45 ..	153	81	72	14	10	67	58	..	4	..	..	..	..	..	..
Unknown ..	11	7	4	..	..	2	3	1	..	..	..	..	..	4	1
Total ..	58,217	29,859	28,358	6,102	5,902	21,200	19,946	2,113	2,093	163	137	118	110	163	170

The racial group 'Malays' includes Indonesians.

Figures excludes 2,179 live-births of wives of non-locally domiciled military and civilian Services personnel.

TABLE 6  
LIVE-BIRTHS WHICH OCCURRED IN 1964  
BY REGISTRATION AREA, RACIAL GROUP OF FATHER AND SEX OF CHILD

Racial Group	SINGAPORE TOTAL			CITY AREA			RURAL AREA		
	M. and F.	M.	F.	M. and F.	M.	F.	M. and F.	M.	F.
Malays	11,709	5,955	5,754	8,307	4,273	4,034	3,402	1,682	1,720
Chinese	40,937	21,114	19,823	36,839	19,039	17,800	4,098	2,075	2,023
Indians and Pakistanis	4,572	2,281	2,291	4,189	2,091	2,098	383	190	193
Eurasians	313	171	142	293	158	135	20	13	7
Europeans	254	131	123	250	128	122	4	3	1
Others	432	207	225	409	197	212	23	10	13
Total	58,217	29,859	28,358	50,287	25,886	24,401	7,930	3,973	3,957

The racial group 'Malays' includes Indonesians.  
Figures exclude 2,179 live-births of wives of non-locally domiciled military and civilian Services personnel.

TABLE 7

## LIVE-BIRTHS WHICH OCCURRED IN 1964

BY PLACE OF USUAL RESIDENCE OF PARENTS, RACIAL GROUP OF FATHER AND SEX OF CHILD

Place of usual Residence	TOTAL			MALAYS		CHINESE		INDIANS AND PAKISTANIS		EURASIANS		EUROPEANS		OTHERS	
	M. and F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
City ..	33,693	17,312	16,381	2,959	2,809	12,668	11,881	1,392	1,384	70	64	104	93	119	150
Katong ..	9,384	4,857	4,527	1,849	1,768	2,611	2,353	293	319	56	46	2	3	46	38
Serangoon	8,767	4,457	4,310	435	440	3,562	3,413	386	400	35	21	12	7	27	29
Bukit Panjang	2,981	1,549	1,432	284	272	1,085	1,013	163	136	5	4	4	2	8	5
Jurong ..	2,765	1,391	1,374	231	224	1,127	1,111	28	37	1	2	..	..	4	..
Southern Islands ..	521	243	278	190	232	40	36	8	6	3	4	1	..	1	..
States of Malaya ..	90	44	46	7	8	17	14	11	9	..	1	7	11	2	3
Overseas ..	16	6	10	..	1	4	2	..	..	1	..	1	7	..	..
Total ..	58,217	29,859	28,358	5,955	5,754	21,114	19,823	2,281	2,291	171	142	131	123	207	225

The racial group 'Malays' includes Indonesians.

Figures exclude 2,179 live-births of wives of non-locally domiciled military and civilian Services personnel.

TABLE 8

## LIVE-BIRTHS WHICH OCCURRED IN 1964

BY PLACE OF USUAL RESIDENCE OF PARENTS, REGISTRATION AREA AND SEX OF CHILD

Place of usual Residence	TOTAL			REGISTRATION AREA					
				CITY AREA			RURAL AREA		
	M. and F.	M.	F.	M. and F.	M.	F.	M. and F.	M.	F.
City ..	33,693	17,312	16,381	33,403	17,169	16,234	290	143	147
Katong ..	9,384	4,857	4,527	6,564	3,445	3,119	2,820	1,412	1,408
Serangoon	8,767	4,457	4,310	6,037	3,083	2,954	2,730	1,374	1,356
Bukit Panjang	2,981	1,549	1,432	2,042	1,061	981	939	488	451
Jurong ..	2,765	1,391	1,374	2,003	1,009	994	762	382	380
Southern Islands ..	521	243	278	143	73	70	378	170	208
States of Malaya ..	90	44	46	79	40	39	11	4	7
Overseas ..	16	6	10	16	6	10	..	..	..
Total ..	58,217	29,859	28,358	50,287	25,886	24,401	7,930	3,973	3,957

Figures exclude 2,179 live-births of wives of non-locally domiciled military and civilian Services personnel.



TABLE 9  
DEATHS REGISTERED IN 1964  
BY REGISTRATION AREA, SEX AND RACIAL GROUP

Racial Group	SINGAPORE TOTAL			CITY AREA			RURAL AREA		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Malays .. ..	1,635	884	751	1,076	604	472	559	280	279
Chinese .. ..	7,813*	4,661	3,151	6,509*	3,942	2,566	1,304	719	585
Indians and Pakistanis	788	588	200	681	504	177	107	84	23
Eurasians .. ..	81	38	43	59	33	26	22	5	17
Europeans .. ..	57	32	25	52	30	22	5	2	3
Others .. ..	60*	36	23	56*	34	21	4	2	2
Total .. ..	10,434†	6,239	4,193	8,433†	5,147	3,284	2,001	1,092	909

\*Includes 1 unknown sex.  
†Includes 2 unknown sex.  
The racial group 'Malays' includes Indonesians.  
Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families,

TABLE 10  
DEATHS REGISTERED IN 1964  
BY PLACE OF USUAL RESIDENCE RACIAL GROUP AND SEX

Place of usual Residence	TOTAL			MALAYS		CHINESE		INDIANS AND PAKISTANIS		EURASIANS		EUROPEANS		OTHERS	
	M. and F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
City ..	6,613*	4,007	2,604	421	348	3,142	2,086	380	120	18	19	21	16	25	15
Katong ..	1,569	902	667	302	261	490	363	87	23	12	9	3	5	8	6
Serangoon	1,326	771	555	58	53	617	445	84	40	6	13	4	2	2	2
Bukit Panjang ..	397	229	168	30	30	176	127	22	10	..	..	1	1	..	..
Jurong ..	361	223	138	32	28	183	107	8	3	..	..	..	..	..	..
Southern Islands ..	78	48	30	27	27	16	2	4	..	1	1	..	..	..	..
States of Malaya	76	47	29	10	3	32	21	3	4	..	1	1	..	1	..
Overseas ..	14	12	2	4	1	5	..	..	..	1	..	2	1	..	..
Total ..	10,434*	6,239	4,193	884	751	4,661	3,151	588	200	38	43	32	25	36	23

\*Includes 2 unknown sex (Chinese and Others).  
The racial group 'Malays' includes Indonesians.  
Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families,



TABLE 11  
DEATHS REGISTERED IN 1964  
BY PLACE OF USUAL RESIDENCE, REGISTRATION AREA AND SEX

Place of usual Residence	TOTAL			REGISTRATION AREA					
				CITY AREA			RURAL AREA		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
City .. ..	6,613*	4,007	2,604	6,418*	3,884	2,532	195	123	72
Katong .. ..	1,569	902	667	888	524	364	681	378	303
Serangoon ..	1,326	771	555	653	427	226	673	344	329
Bukit Panjang ..	397	229	168	166	114	52	231	115	116
Jurong .. ..	361	223	138	208	128	80	153	95	58
Southern Islands ..	78	48	30	24	20	4	54	28	26
States of Malaya ..	76	47	29	64	40	24	12	7	5
Overseas .. ..	14	12	2	12	10	2	2	2	..
Total .. ..	10,434*	6,239	4,193	8,433*	5,147	3,284	2,001	1,092	909

\*Includes 2 unknown sex.  
Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families.

TABLE 12

DEATHS REGISTERED IN 1964  
BY AGE GROUP, RACIAL GROUP AND SEX

Age Group	TOTAL			MALAYS		CHINESE		INDIANS AND PAKISTANIS		EURA- SIANS		EURO- PEANS		OTHERS	
	M. and F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Under 1 day ..	279*	157	121	31	28	115	80	11	12	..	..	..	1	..	..
1 day and under															
2 days ..	172	106	66	25	21	75	40	6	4	..	..	..	1	..	..
2 days and under															
3 days ..	135	81	54	17	7	54	37	7	10	1	..	1	..	1	..
3 days and under															
4 days ..	109	68	41	18	13	44	26	5	1	1	..	..	..	..	1
4 days and under															
5 days ..	63	38	25	8	5	30	17	..	3	..	..	..	..	..	..
5 days and under															
6 days ..	40	24	16	3	3	21	13	..	..	..	..	..	..	..	..
6 days and under															
7 days ..	47	29	18	8	8	18	7	3	2	..	..	..	1	..	..
7 days and under															
14 days ..	172	97	75	26	17	63	51	7	6	..	..	..	..	1	1
14 days and under															
21 days ..	70	33	37	6	6	24	26	3	5	..	..	..	..	..	..
21 days and under															
28 days ..	56	36	20	10	7	21	11	3	2	..	..	..	..	2	..
Neo-Natal Deaths	1,143*	669	473	152	115	465	308	45	45	2	..	1	3	4	2
28 days and under															
2 months ..	118	70	48	27	18	39	21	3	8	..	..	..	1	1	..
2 months and															
under 3 months	74	49	25	19	11	23	13	7	1	..	..	..	..	..	..
3 months and															
under 4 months	68	35	33	7	12	24	17	4	2	..	2	..	..	..	..
4 months and															
under 5 months	45	24	21	9	8	11	12	4	1	..	..	..	..	..	..
5 months and															
under 6 months	44	17	27	9	9	8	17	..	1	..	..	..	..	..	..
6 months and															
under 7 months	65	42	23	18	6	21	15	3	2	..	..	..	..	..	..
7 months and															
under 8 months	38	22	16	15	4	7	11	..	1	..	..	..	..	..	..
8 months and															
under 9 months	45	26	19	6	8	15	9	3	2	1	..	..	..	1	..
9 months and															
under 10 months	35	21	14	9	7	10	5	2	2	..	..	..	..	..	..
10 months and															
under 11 months	25	12	13	2	6	9	6	1	1	..	..	..	..	..	..
11 months and															
under 1 year ..	38	17	21	6	9	10	11	..	1	..	..	1	..	..	..
Infant Mortality	1,738*	1,004	733	279	213	642	445	72	67	3	2	2	4	6	2
1 year and under															
2 years ..	193	99	94	39	39	52	51	8	4	..	..	..	..	..	..
2 years and															
under 3 years	120	64	56	20	18	38	35	6	2	..	..	..	..	..	1
3 years and															
under 4 years	76	45	31	11	6	33	21	1	4	..	..	..	..	..	..
4 years and															
under 5 years	76	42	34	13	10	26	22	3	1	..	..	..	1	..	..
5—9 years ..	198	120	78	19	17	85	52	15	7	1	..	..	1	..	1
10—14 years ..	137	89	48	16	10	66	36	6	2	..	..	..	..	1	..
15—19 years ..	140	84	56	8	10	71	39	4	6	..	1	1	..	..	..
20—24 years ..	149	102	47	17	17	78	27	5	2	..	..	1	1	1	..
25—29 years ..	166	102	64	18	17	71	41	11	5	..	1	1	..	1	..
30—34 years ..	190	106	84	18	22	76	55	11	4	..	1	1	2	..	..
35—39 years ..	257	141	116	20	21	88	80	29	11	1	..	3	3	..	1
40—44 years ..	359	243	116	27	23	154	84	54	7	6	2	1	..	1	..
45—49 years ..	495	331	164	37	26	226	120	62	15	4	..	2	3	..	..
50—54 years ..	821	564	257	50	55	425	191	77	8	4	..	6	2	2	1
55—59 years ..	965	650	315	56	48	518	250	67	15	1	2	3	..	5	..
60—64 years ..	1,154	795	359	71	59	642	273	69	17	6	6	2	..	5	4
65—69 years ..	946	595	351	59	38	492	290	35	8	3	7	4	3	2	5
70—74 years ..	861	487	374	40	27	410	327	29	9	3	6	..	1	5	4
75—79 years ..	632	301	331	25	29	259	289	10	3	3	7	2	1	2	2
80—84 years ..	441	166	275	23	20	127	248	9	2	3	2	2	2	2	1
85 years and over	293	86	207	15	26	67	172	3	1	..	6	1	1	..	1
Unknown ..	27†	23	3	3	..	15	3	2	..	..	..	..	..	3	..
Total ..	10,434	6,239	4,193	884	751	4,661	3,151	588	200	38	43	32	25	36	23

\*Includes 1 unknown sex (Chinese).

†Includes 1 unknown sex (Others).

‡Includes 2 unknown sex.

The racial group 'Malays' includes Indonesians.

Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families.

TABLE 13

## DEATHS REGISTERED IN 1964

BY REGISTRATION AREA, AGE GROUP AND SEX

Age Group	TOTAL			CITY AREA			RURAL AREA		
	M. and F.	M.	F.	M. and F.	M.	F.	M. and F.	M.	F.
Under 1 day ..	279*	157	121	257*	142	114	22	15	7
1 day and under 2 days	172	106	66	163	99	64	9	7	2
2 days and under 3 days	135	81	54	126	75	51	9	6	3
3 days and under 4 days	109	68	41	102	64	38	7	4	3
4 days and under 5 days	63	38	25	62	37	25	1	1	..
5 days and under 6 days	40	24	16	38	23	15	2	1	1
6 days and under 7 days	47	29	18	41	24	17	6	5	1
7 days and under 14 days	172	97	75	154	90	64	18	7	11
14 days and under 21 days	70	33	37	64	29	35	6	4	2
21 days and under 28 days	56	36	20	52	33	19	4	3	1
Neo-Natal Deaths ..	1,143*	669	473	1,059*	616	442	84	53	31
28 days and under									
2 months ..	118	70	48	90	57	33	28	13	15
2 months and under									
3 months ..	74	49	25	56	35	21	18	14	4
3 months and under									
4 months ..	68	35	33	50	26	24	18	9	9
4 months and under									
5 months ..	45	24	21	33	15	18	12	9	3
5 months and under									
6 months ..	44	17	27	37	15	22	7	2	5
6 months and under									
7 months ..	65	42	23	48	27	21	17	15	2
7 months and under									
8 months ..	38	22	16	31	17	14	7	5	2
8 months and under									
9 months ..	45	26	19	34	19	15	11	7	4
9 months and under									
10 months ..	35	21	14	31	19	12	4	2	2
10 months and under									
11 months ..	25	12	13	21	10	11	4	2	2
11 months and under									
1 year ..	38	17	21	27	12	15	11	5	6
Infant Mortality ..	1,738*	1,004	733	1,517*	868	648	221	136	85

\* Includes neo-natal deaths.

Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families.



TABLE 13 — *continued*

## DEATHS REGISTERED IN 1964

BY REGISTRATION AREA, AGE GROUP AND SEX

Age Group	TOTAL			CITY AREA			RURAL AREA		
	M. and F.	M.	F.	M. and F.	M.	F.	M. and F.	M.	F.
1 year and under 2 years	193	99	94	151	81	70	42	18	24
2 years and under 3 years	120	64	56	99	52	47	21	12	9
3 years and under 4 years	76	45	31	66	38	28	10	7	3
4 years and under 5 years	76	42	34	64	37	27	12	5	7
5—9 years ..	198	120	78	164	101	63	34	19	15
10—14 years ..	137	89	48	124	80	44	13	9	4
15—19 years ..	140	84	56	127	78	49	13	6	7
20—24 years ..	149	102	47	142	97	45	7	5	2
25—29 years ..	166	102	64	151	93	58	15	9	6
30—34 years ..	190	106	84	166	98	68	24	8	16
35—39 years ..	257	141	116	218	120	98	39	21	18
40—44 years ..	359	243	116	305	207	98	54	36	18
45—49 years ..	495	331	164	423	291	132	72	40	32
50—54 years ..	821	564	257	697	493	204	124	71	53
55—59 years ..	965	650	315	782	537	245	183	113	70
60—64 years ..	1,154	795	359	926	637	289	228	158	70
65—69 years ..	946	595	351	738	473	265	208	122	86
70—74 years ..	861	487	374	637	367	270	224	120	104
75—79 years ..	632	301	331	447	219	228	185	82	103
80—84 years ..	441	166	275	299	116	183	142	50	92
85 years and over ..	293	86	207	166	42	124	127	44	83
Unknown ..	27*	23	3	24*	22	1	3	1	2
Total ..	10,434 †	6,239	4,193	8,433†	5,147	3,284	2,001	1,092	909

\*Includes 1 unknown sex.

†Includes 2 unknown sex.

Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families.



TABLE 14  
LIVE-BIRTHS AND CRUDE BIRTH RATES: 1954 AND 1964

Racial Group					1954		1964	
					Number	Rate*	Number	Rate*
Malays	..	..	..	..	8,118	49.0	11,709	45.4
Chinese	..	..	..	..	42,850	45.3	40,937	30.0
Indians and Pakistanis	..	..	..	..	4,269	40.8	4,572	30.5
Eurasians	..	..	..	..	330	30.8	313	21.7
Europeans	..	..	..	..	895	23.8	254	16.8
Others	..	..	..	..	567	56.7	432	26.5
Total ..					57,029	45.7	58,217	32.0

\*Number of live-births per 1,000 mid-year population.

Notes: (i) Figures for 1954 *include* live-births of wives of non-locally domiciled Services personnel (including United Kingdom-based civilians employed by the Services).

(ii) Figures for 1954 *exclude* 2,179 live-births of wives of non-locally domiciled Services personnel (including United Kingdom-based civilians employed by the Services).

(iii) The racial group 'Malays' includes Indonesians.

TABLE 15  
DEATHS AND CRUDE DEATHS RATES: 1954 AND 1964

Racial Group					1954		1964	
					Number	Rate*	Number	Rate*
Malays	..	.	..	..	1,933	11.7	1,635	6.3
Chinese	..	..	..	..	7,752	8.2	7,813	5.7
Indians and Pakistanis	..	..	..	..	805	7.7	788	5.3
Eurasians	..	..	..	..	94	8.8	81	5.6
Europeans	..	..	..	..	107	2.8	57	3.8
Others	..	..	..	..	99	9.9	60	3.7
Total ..					10,790	8.6	10,434	5.7

\*Number of deaths per 1,000 mid-year population.

Notes: (i) Figures for 1954 *include* deaths of non-locally domiciled Services personnel (including United Kingdom-based civilians employed by the Services) and members of their families.

(ii) Figures for 1964 *exclude* 76 deaths of non-locally domiciled Services personnel (including United Kingdom-based civilians employed by the Services) and members of their families.

(iii) The racial group 'Malays' includes Indonesians.

TABLE 16

## INFANT MORTALITY AND INFANT MORTALITY RATES: 1962—1964

Racial Group	1962		1963		1964	
	Number	Rate*	Number	Rate*	Number	Rate*
Malays .. .. .	540	48.0	455	39.3	492	42.0
Chinese .. .. .	1,142	27.2	1,061	25.1	1,088	26.6
Indians and Pakistanis ..	138	29.7	137	29.7	139	30.4
Eurasians .. .. .	13	36.0	4	12.6	5	16.0
Europeans .. .. .	1	3.4	12	39.3	6	23.6
Others .. .. .	9	18.6	5	9.8	8	18.5
Total ..	1,843	31.2	1,674	28.1	1,738	29.9

\*Number of deaths under 1 year of age per 1,000 live-births.

*Note:* Figures exclude 43, 42 and 32 deaths of children under 1 year of age of non-locally domiciled military and civilian Services personnel for the years 1962, 1963 and 1964 respectively.

TABLE 17

## STILL-BIRTHS AND STILL-BIRTH RATES: 1962—1964

<i>Year</i>	<i>Number</i>	<i>Rate*</i>
1962	740	12.4
1963	739	12.3
1964	694	11.8

\*Number of still-births per 1,000 total live-births and still-births.

*Note:* Figures exclude 14, 26 and 30 still-births of wives of non-locally domiciled military and civilian Services personnel for the years 1962, 1963 and 1964 respectively.

TABLE 18

## MATERNAL MORTALITY AND MATERNAL MORTALITY RATES: 1962—1964

<i>Year</i>	<i>Number</i>	<i>Rate*</i>
1962	23	0.4
1963	21	0.3
1964	23†	0.4†

\*Number of maternal deaths per 1,000 total live-births and still-births.

†Provisional.

*Note:* There were no maternal deaths of non-locally domiciled military and civilian Services personnel and their families for the years 1962, 1963 and 1964.

TABLE 19

DEATHS FROM TUBERCULOSIS (ALL FORMS) AND  
TUBERCULOSIS DEATH RATES: 1961—1964

<i>Year</i>	<i>Number</i>	<i>Rate*</i>
1961	647	38.35
1962	654	37.74
1963	669	37.69
1964	703†	38.63†

\*Number of tuberculosis (all forms) deaths per 100,000 mid-year population.

†Provisional.

*Note:* Tuberculosis deaths of non-locally domiciled military and civilian Services personnel and their families, if any, are included in the above figures.

TABLE 20

## MIGRATION STATISTICS BY SEA AND AIR DURING 1964

## (a) Arrivals

Race	ADULTS		CHILDREN*		Total
	Male	Female	Male	Female	
Malays .. ..	5,859	1,966	358	349	8,532
Chinese .. ..	24,866	9,686	966	662	36,180
Indians and Pakistanis ..	11,824	2,773	1,184	838	16,619
Eurasians .. ..	263	111	31	31	436
Europeans .. ..	53,140	27,565	3,196	2,324	86,225
Other Races .. ..	13,565	1,361	235	122	15,283
Total—ALL RACES ..	109,517	43,462	5,970	4,326	163,275

## (b) Departures

Race	ADULTS		CHILDREN*		Total
	Male	Female	Male	Female	
Malays .. ..	7,017	2,181	441	370	10,009
Chinese .. ..	27,624	11,125	1,093	634	40,476
Indians and Pakistanis ..	20,247	3,381	1,733	1,402	26,763
Eurasians .. ..	311	141	36	23	511
Europeans .. ..	53,285	27,539	3,721	2,825	87,370
Other Races .. ..	11,719	1,479	215	182	13,595
Total—ALL RACES ..	120,203	45,846	7,239	5,436	178,724

\*Under 12 years of age.

The racial group 'Malays' includes Indonesians.





SECTION II  
PUBLIC HEALTH DIVISION





## 6. PUBLIC HEALTH DIVISION

### INTRODUCTION

THE State of Singapore is comprised of the main island of Singapore with several small surrounding islands within its territorial waters. The main island is 27 miles long and 14 miles wide with a land area of 216 square miles. The combined area of the smaller islands is about 10 square miles.

With the completion of integration of the former City Council Health Services and the Rural Board Health Department Services, physically and financially, at the end of 1961 the Ministry of Health has been re-organised with the formation of the Public Health Division under the charge of the Deputy Director of Medical Services (Health). The Public Health Services continued to be maintained at a satisfactory level despite operational difficulties during the year. Dr. K. Kanagaratnam was the Deputy Director of Medical Services (Health).

The Public Health Division is responsible for Preventive Health Services under the following branches:—

- (1) Environmental Health.
- (2) Quarantine and Epidemiology.
- (3) School Health Services.
- (4) Maternal and Child Health Services.
- (5) Training and Health Education.
- (6) Markets and Hawkers.
- (7) Other Services under Public Health Headquarters Administration.

It will be useful to recount the major events of public health significance in 1964:

*Spring Cleaning Campaign.*—As public cleansing has always been one of the major problems in the Public Health Service, the Minister for Health took a personal interest in the re-organisation of the Public Cleansing Department. In early 1964 a “Spring Cleaning Campaign” was initiated by the Minister which lasted from 1st February, 1964 to 31st May, 1964. During the campaign various problems in refuse disposal and collection were brought to the surface. These served as basis for investigations and study in order that long-term solutions may be found.

At the end of 4 months, the Minister was able to announce that the campaign was a qualified success, and that the City looked brighter and cleaner.

*Formation of the Public Health Advisory Board.*—After the Spring Cleaning Campaign (February to May 1964) on the direction of the Minister, the Public Health Advisory Board was formed in order that more effective

and practical measures for the preservation and maintenance of the highest possible public health standards may be formulated. The Board had representatives from other Government Ministries and Government agencies whose activities had direct public health importance or with whom liaison was essential for operational efficiency.

The Board gave immediate attention to three pressing public health problems — viz.: (i) collection and disposal of refuse; (ii) hawkers and markets; and (iii) cattle straying on public streets.

Fifteen meetings were held during the year resulting *inter alia* in: (i) the formulation of the Hawkers Code; (ii) the planning of the resiting of hawkers by stages in five constituencies; and (iii) better co-ordination with other government departments.

*Cattle Ordinance.*—Toward the end of the year legislation was also introduced to control the “cattle nuisance”, which has been a problem for some time. The problem had become more acute as much of the land formerly available for “cattle grazing” had been built upon. Cattle were found on public roads and on public and private property. The Cattle Ordinance giving new powers to the health authority was passed. Under its provisions it is anticipated that nuisances connected with cattle will once and for all be effectively eliminated.

*Civil Disturbances.*—1964 also saw two episodes of civil disturbances occurring in July and September. All branches and sub-sections of the Public Health Division, especially the Environmental Health Services, were temporarily disrupted. With the imposition of curfew, emergency public health measures were instituted, and with the restoration of law and order, normal public health services were resumed. During the disturbances, the majority of the staff rose to the occasion in order that essential services may be carried on. The Public Health Division staff in general lived up to expectations, and in many cases did their duty regardless of personal safety. One Public Cleansing worker lost his life during the second riots. There were no outbreaks of epidemic diseases as a result of the disturbances although there was unavoidable increase in fly and mosquito nuisances following the outbreaks caused by the temporary breakdown of service.

*Cholera Outbreaks.*—During the year there were three episodes of El Tor Cholera — viz., 13th January, 1964 to 3rd February, 1964 (3 cases), 13th April, 1964 to 27th June, 1964 (20 cases with 3 deaths) and 27th August, 1964 (1 case). There was thus total of 24 cases in all with three deaths during these three episodes. Seven cholera carriers were discovered and treated during the second episode. From an epidemiological point of view, the outbreaks were possible hazards, as El Tor Cholera had since 1963 become endemic in Malaysia. Two of the episodes with one case and three cases were minor but the other episode with 20 cases was brought under control with intensive work and investigations done by the staff of the Environmental Health and the Quarantine and Epidemiology Branches.



*Malaria at Fuyong Estate, off 9 m.s. Bugit Timah Road.*—After an absence of seven years “indigenous” malaria made its appearance in the State in the shape of an outbreak of benign tertian malaria at Fuyong Estate off 9 m.s., Bukit Timah Road in August and September. Altogether 30 cases were reported. The outbreak was the result mainly of control measures having broken down temporarily due to labour difficulties. This outbreak was brought under control by emergency measures using intensive mass drug prophylaxis and anti-adult measures, both of which served to break transmission while anti-larval operations were restored. Approximately 6,300 persons in the affected areas were given prophylactic drug treatment in connection with the emergency measures.

#### THE ENVIRONMENTAL HEALTH SECTION

This section is responsible for — (1) general hygiene and sanitation (including public cleansing); (2) food hygiene and control of the sale of food and drugs; (3) Anti-malaria/Anti-mosquito control.

This section is headed by a Senior Health Officer. For administrative purposes, Singapore is divided into six districts — viz., Katong, Serangoon, Bukit Panjang/Jurong, Southern Islands, City (South) and City (North); each under the charge of a District Health Officer.

Maintenance of good general sanitation and hygiene is the main function of the Public Health Inspectorate of the Environmental Health Section. Mosquito, fly and other miscellaneous complaints from the general public were dealt with.

Cleansing services in the City area are under the direction of the Superintendent, Public Cleansing while cleansing services in the Rural area are carried out by the Rural Cleansing Sections under the charge of the respective District Health Officers. During the year cleansing services in the State were maintained and initial steps to improve the service undertaken.

The Environment Health Section also carried out inspections on licensed premises in order to maintain a reasonable standard of food hygiene in food establishments. Samples of food and drugs were taken and submitted to the Chief Chemist for analysis. 92,209 pounds of unsound assorted food and 91 bottles of hair darkener containing lead were destroyed, while 12,326 bottles and 68 tins of substandard food and deleterious drugs were forfeited on Court order.

The Food and Drugs Unit of the Environmental Health Section also assisted in investigations of food poisoning with sodium arsenite, as a result of which the Poisons Inspectorate instituted strong preventive measures regarding storage and handling of sodium arsenite in a certain glass factory.

With the outbreak of malaria at Fuyong Estate, the Anti-Mosquito Section of the Environmental Health Section stepped up in anti-malaria maintenance work in dangerous areas. More frequent inspections of tidal areas such as the Kallang Basin where land reclamation for development were instituted to ensure the free flow of the tides so as to prevent the breeding of malaria vectors.

### THE QUARANTINE AND EPIDEMIOLOGY SECTION

This section is under the charge of a Senior Health Officer.

The function of the Quarantine Section is to maintain control of dangerous infectious diseases by surveillance of international traffic. During the year 132,171 passengers and crew were inspected by the Marine Port Health Service and 156,645 passengers and crew inspected by the Airport Health Service.

The Vaccination Centre under this section also provides vaccination service to the public and to travellers, and issues international vaccination certificates. A total of 56,736 vaccinations were done during the year for travellers.

The Epidemiology Section, which is responsible for investigations and administers the control of infectious disease conditions locally, maintains measures against yellow fever around the Airport, and maintains a regular check on rodent life in the Port area. During the year, the Section was engaged in the Cholera Control programme besides carrying out investigations on notifiable infectious diseases.

### THE SCHOOL HEALTH SERVICE

The School Health Service in Singapore is centrally administered at the Institute of Health at Outram Road.

This service continues to prevent diseases and to promote and maintain good health among an important section of the population — i.e., the school-going population. However, with the school population increasing annually further growth of the service will become necessary. Development of other specified child health services will also become necessary.

The School Health Service provides the following:

- (1) Routine and special medical examination of all school children on a selective basis.
- (2) Treatment of minor ailments and nutritional defects in school clinics.
- (3) Reference of cases to specialists in the various institutions for investigations, treatment or advice.
- (4) Control of tuberculosis in the school population, including teachers, hawkers and other staff.
- (5) Control of infectious diseases.
- (6) Ensuring the compliance of the provisions of the Education Ordinance, 1957 and the regulations made thereunder.

At the end of 1964 there were 584 schools in the State of Singapore with 59,084 new entrants, as against 58,020 in 1963. The total school population rose from 429,150 in 1963 to 457,136 in 1964 — an increase of 27,986 pupils.



## THE MATERNAL AND CHILD HEALTH SERVICES

These services are carried out on an island-wide basis. Its centrally administered office is based at the Institute of Health, Outram Road. This branch is responsible for preventive services and a limited amount of curative health services concerning the health needs of the mother and child population of Singapore.

With its 34 main clinics, 25 visiting centres and five kampongs midwife centres, the Maternal and Child Health Services provide the following:

- (1) Antenatal care.
- (2) Natal care through the Domiciliary Midwifery Service and Domiciliary After-Care Service operating at main clinics and kampong midwife centres with resident midwives.
- (3) Post-natal care.
- (4) Immunisation against small-pox, diphtheria, whooping cough, tetanus and poliomyelitis for pre-school children.
- (5) Supervision of Midwives.

In spite of two civil disturbances, normal routine antenatal attendances rose from 120,627 in 1963 to 141,473 in 1964 — an increase of 20,846.

During the year attendances in infant clinics fell from 447,539 in 1963 to 443,273 in 1964. Attendances in pre-school sessions also fell from 382,931 in 1963 to 366,345 in 1964. This was due to the disruption of services during the two periods of civil disturbances in July and September.

## THE TRAINING AND HEALTH EDUCATION BRANCH

This branch is under the charge of a Senior Health Officer and carries out the following functions:

- (1) Training of ancillary health personnel, including: (a) Public Health Inspectors; (b) Public Health Nurses. Both these training courses were modelled on the requirements of the Royal Society of Health in London whose certificates are issued to the successful candidates.
- (2) *Health Education*.—This sub-section assists in the training courses and refresher courses in health education for specific categories of health personnel such as Public Health Inspectors-in-Training, Public Health Inspectors and candidates for Public Health Inspectors' Diploma and Public Health Nursing and Health Visitors of the Royal Society of Health. It is also a resource department for other departments/organisations who may request for health education material from time to time.
- (3) *Special Assignments*.—This sub-section often carries out special assignments for the Division in various fields.

HAWKERS AND MARKETS

This branch is under the control of the Superintendent, Hawkers and Markets, and deals with licensing and control of hawkers and the supervision and licensing of markets. The Hawkers and Markets Branch discharges its functions in two separate sections — viz., the Hawkers Section and the Markets Section.

Mr. Lim Chooi Sian, Director of the Central Complaints Bureau was seconded for duty as Officer in charge of Re-organisation in November 1964.

On Sunday morning, 11th October, 1964, at 10 o'clock a fire broke out which made the Markets and Hawkers Department building became untenable and there was loss of equipment and records. The Hawkers and Markets Department was consequently shifted temporarily to the first floor of the Registry of Vehicles building in Middle Road. Towards the end of 1964 the Ministry of Education kindly made available accommodation at the former Malay Craft School at Scotts Road where the Department is now housed. It is expected that this building will be occupied by the Hawkers and Markets Department for two years.

Three new markets were completed during the year.

OTHER SERVICES UNDER PUBLIC HEALTH HEADQUARTERS  
ADMINISTRATION

These services include: (1) The Public Health Engineering Unit; (2) Cemeteries and Crematoria; (3) Personnel (Labour) Unit; (4) The Transport Centre which continued to provide specialised services for the Division.

VITAL STATISTICS

TABLE 21  
POPULATION ESTIMATES BY RACIAL GROUP AND SEX AS ON  
30TH JUNE, 1964  
Thousands

—		Total	Malays*	Chinese	Indians and Pakis- tanis	Eura- sians	Euro- peans	Others
Total Population	..	1,820.0	257.8	1,366.5	149.9	14.4	15.1	16.3
Males	..	944.9	132.6	690.8	96.2	7.7	8.5	9.1
Females	..	875.1	125.2	675.7	53.7	6.7	6.6	7.2

1. \*Include Indonesians.
2. The Population Estimates exclude the following categories enumerated in the June 1957 census:—

(a) Non-Locally domiciled services personnel (including United Kingdom—based civilians employed by the Services) and their families

..

27,299

(b) Transients afloat

..

3,466
3. Births and deaths of persons within category 2 (a) are excluded from these estimates.
4. Births and deaths of persons within category 2 (b) are included in these estimates, but the number of such is negligible.



TABLE 22  
TABLE 22 GIVES VITAL STATISTICS IN THE STATE OF SINGAPORE FOR PAST 5 YEARS

	1960		1961		1962		1963		1964	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Live Births ..	61,775	37.8*	59,930	35.5	58,977	34.0	59,577	33.6	58,127	32.0
Still Births ..	886	14.1†	766	12.6	740	12.4	739	12.3	694	11.8
Perinatal Deaths ..	1,747	27.9‡	1,593	26.2	1,593	26.7	1,578	26.2	1,539	26.1
Neonatal Deaths ..	1,093	17.7§	1,059	17.7	1,127	19.1	1,097	18.4	1,143	19.6
Infant Deaths (Birth to 1 year)	2,158	34.9	1,937	32.3	1,843	31.2	1,674	28.1	1,738	29.9
Maternal Deaths ..	28	0.4¶	24	0.39	23	0.4	21	0.3	23	0.4
Deaths ..	10,210	6.2**	10,027	5.9	10,178	5.9	10,138	5.7	10,434	5.7

\* The Crude Birth Rate —Number of live births/1,000 mid-year population.  
† The Still Birth Rate —Number of still births/1,000 still and live births.  
‡ The Perinatal Mortality Rate —Number of deaths under 7 days of age plus still births /1,000 still and live births.  
§ The Neonatal Mortality Rate —Number of deaths under 28 days of age/1,000 live births.  
|| The Infant Mortality Rate —Number of deaths under 1 year of age/1,000 live births.  
¶ The Maternal Mortality Rate —Number of maternal deaths per 1,000 total live and still births.  
\*\* The Crude Death Rate —Number of deaths /1,000 mid-year population.

These figures have been obtained from the 1960 Report on the Registration of births and deaths, marriages and persons, and from the monthly demographic bulletins for the State of Singapore for 1961, 1962, 1963 and 1964.

TABLE 23

TABLE 23 GIVES THE INFANT MORTALITY RATE BY ETHNIC GROUPS IN SINGAPORE FOR 1961, 1962, 1963 AND 1964

				1961	1962	1963	1964
				Infant Mortality Rate	Infant Mortality Rate	Infant Mortality Rate	Infant Mortality Rate
All Races	..	..	..	32.3	31.2	28.1	29.9
Malays	..	..	..	56.8	48.0	39.3	42.0
Chinese	..	..	..	26.3	27.2	25.1	26.6
Indians	..	..	..	33.4	29.7	29.5	30.4
Eurasians	..	..	..	16.6	36.0	12.7	16.0
Europeans	..	..	..	24.6	3.4	39.2	23.6
Others	..	..	..	21.1	18.6	9.8	18.5

These figures have been obtained from the Monthly Demographic Bulletin issued by the Department of Statistics, Singapore.

TABLE 24

TABLE 24 GIVES THE PERINATAL MORTALITY RATE BY ETHNIC GROUPS IN SINGAPORE, 1961, 1962, 1963 AND 1964

				1961	1962	1963	1964
				Perinatal Mortality Rate	Perinatal Mortality Rate	Perinatal Mortality Rate	Perinatal Mortality Rate
All Races	..	..	..	26.2	26.7	26.2	26.1
Malays	..	..	..	36.3	31.9	28.4	32.2
Chinese	..	..	..	22.6	24.7	24.7	23.7
Indians	..	..	..	36.0	32.5	33.4	33.7
Eurasians	..	..	..	24.5	27.5	12.5	15.8
Europeans	..	..	..	27.7	6.8	57.5	31.0
Others	..	..	..	22.8	26.5	19.3	16.0

These figures have been obtained from Monthly Demographic Bulletin issued by the Department of Statistics, Singapore.



## SINGAPORE VITAL STATISTICS, 1962 — 1964

(a) BY PLACE OF USUAL RESIDENCE

Vital Events	1962				1963				1964			
	Total	City	Rural	Other*	Total	City	Rural	Other*	Total	City	Rural	Other*
Live-births	58,977	33,837	25,041	99	59,530	34,479	24,938	113	58,217	33,693	24,418	106
Still-births	740	438	307	2	739	415	323	1	694	437	225	2
Total births	59,717	34,268	25,348	101	60,269	34,894	25,261	114	58,911	34,130	24,673	108
Maternal deaths	23	11	12	..	21	10	11	..	24	11	13	..
Perinatal deaths	1,593	963	628	2	1,592	950	640	2	1,539	962	574	3
Neonatal deaths	1,127	693	432	2	1,097	673	423	1	1,143	707	435	1
Infant deaths	1,843	1,070	768	5	1,674	988	684	2	1,738	1,046	689	3
Still-birth Rate†	12.4	12.6	12.1	19.8	12.3	11.9	12.8	8.8	11.8	12.8	10.3	18.5
Maternal Mortality Rate†	0.4	0.3	0.5	..	0.3	0.3	0.4	..	0.4	0.3	0.5	..
Perinatal Mortality Rate†	26.7	28.1	24.8	19.8	26.4	27.2	25.3	17.5	26.1	28.2	23.3	27.8
Neonatal Mortality Rate†	19.1	20.5	17.3	20.2	18.4	19.5	17.0	8.8	19.6	21.0	17.8	9.4
Infant Mortality Rate‡	31.2	31.6	30.7	50.5	28.1	28.7	27.4	17.7	29.9	31.0	28.2	28.3

Note:— \*Others refers to States of Malaya and 'overseas'.

†Rate per thousand total live-births and still-births.

‡Rate per thousand live-births.

The above figures exclude events occurring among non-locally domiciled Services personnel (including United Kingdom based civilians employed by the Services) and their families.

## PUBLIC HEALTH 1964

## (b) BY REGISTRATION AREA

Vital Events	1962			1963			1964		
	Total	City	Rural	Total	City	Rural	Total	City	Rural
Live-births .. .. .	58,977	49,700	9,277	59,530	51,043	8,487	58,217	50,287	7,930
Still-births .. .. .	740	659	81	739	672	67	694	640	54
Total births .. .. .	59,717	50,359	9,358	60,269	51,715	8,554	58,911	50,927	7,984
Maternal deaths .. .. .	23	20	3	21	20	1	24	20	4
Perinatal deaths .. .. .	1,593	1,469	124	1,592	1,476	116	1,539	1,429	110
Neonatal deaths .. .. .	1,127	1,059	68	1,097	1,102	85	1,143	1,059	84
Infant deaths .. .. .	1,843	1,584	259	1,674	1,448	226	1,738	1,517	221
Still-birth Rate† .. .. .	12.4	13.1	8.7	12.3	13.0	7.8	11.8	12.6	6.8
Maternal Mortality Rate†	0.4	0.4	0.3	0.3	0.4	0.1	0.4	0.4	0.5
Perinatal Mortality Rate†	26.7	29.2	13.3	26.4	28.5	13.6	26.1	28.1	13.8
Neonatal Mortality‡	19.1	21.3	7.3	18.4	21.6	10.0	19.6	21.1	10.6
Infant Mortality Rate‡	31.2	31.9	27.9	28.1	28.4	26.6	29.9	30.2	27.9

Note:— \*Others refers to States of Malaya and 'overseas'.

†Rate per thousand total live-births and still-births.

‡Rate per thousand live-births.

The above figures exclude events occurring among non-locally domiciled Services personnel (including United Kingdom based civilians employed by the Services) and their families.

## 7. ENVIRONMENTAL HEALTH SERVICES

### INTRODUCTION

The Environmental Health Branch provides a large part of the Public Health Services for the whole State by maintaining effective control over:—

- (1) General Hygiene and Sanitation
- (2) Food Hygiene and the Control of the Sale of Food and Drugs
- (3) Malarial and Mosquito Control

*Organisation and Staff.*—The Senior Health Officer, Environmental Health maintains an overall control of the services provided by the Environmental Health Branch. For administrative purposes, the State is divided into six district viz. Katong, Serangoon, Bukit Panjang/Jurong, Southern Islands, City South and City North, each under the charge of a District Health Officer.

The Public Health Inspectorate is headed by the Chief Public Health Inspector. The Health Inspectorate is again organised on a district basis under the charge of a Senior Public Health Inspector who works under the direction of the District Health Officers.

In the City area, the Superintendent of City Cleansing Department is in charge of the Cleansing Services while in the Rural Districts the Cleansing Service is run by the District Health Officer.

The Superintendent of City A.M.D. and the Chief Food and Drugs Inspector work under the direction of the respective Health Officers responsible for these functions.

#### *Staff*

##### (a) Health Officers

Senior Health Officer	...	1
District Health Officers	...	7

##### (b) Public Health Inspectorate

Chief Public Health Inspector	...	1
Chief Food and Drugs Inspector	...	1
Senior Public Health Inspectors	...	5*
Ag. Food & Drugs Inspectors	...	2
Public Health Inspectors	...	56
Public Health Inspectors-in-training	...	12
Piggery Overseers	...	2

\* Senior Public Health Inspector (Quarantine and Epidemiology) covers Southern Islands.

##### (c) Cleansing

###### *City*

Superintendent	...	1 (Acting)
Assistant Superintendents	...	1 (Acting)
Divisional Cleansing Inspectors	...	3
Senior Cleansing Inspectors	...	3
Cleansing Inspectors	...	26
Conservancy Overseers	...	2
Conservancy Sub-Overseers	...	42



<i>Rural</i>		
Senior Cleansing Inspectors	...	3
Cleansing Inspectors	...	11
Technical Subordinates	...	6
Cleansing Overseers	...	20
(d) Anti-Mosquito Department		
<i>City</i>		
Health Officer	...	1
Superintendent	...	1
Technical Subordinate (Super Scale)	...	1
Technical Subordinate (Special Grade)	...	3
Technical Subordinates	...	17
Laboratory Assistant	...	1
<i>Rural</i>		
Senior Technical Subordinates	...	3
Technical Subordinates	...	19

The previous posts of A.M. Inspector, Senior Overseer, Overseer, Junior Overseer and Surveyor/Draftsman were redesignated as Technical Subordinate (Super Scale), Technical Subordinate (Special Grade), Technical Subordinate and Technician with effect from 1st September, 1963 according to the Integration Ordinance.

Secondment: Two Public Health Inspectors were seconded to the Port Health Office to perform clearance of ships. Four Public Health Inspectors were seconded to the Quarantine and Epidemiology Section to do investigation of infectious diseases. Eight Public Health Inspectors were seconded to the City Abattoirs to assist in the inspection of meat.

Training: During the year under review, four Public Health Inspectors in training attended the course leading to the Diploma of the Royal Society for the Promotion of Health.

#### GENERAL HYGIENE AND SANITATION

This includes (a) general sanitation and Kampong Sanitation, (b) water supplies (c) licensed premises (d) offensive and dangerous trades, (e) the cleansing services.

(a) *General Sanitation*.—General sanitation is the main function of the Public Health Inspectorate. The Public Health Inspectorate inspects all premises licensed by the Environmental Health Branch to ensure that proper health standards are maintained. In addition all unlicensed premises are checked by the Inspectorate and, if necessary, Court action is taken. Besides, the Inspectorate also inspects and reports on health requirements for Public and Beer Houses, Printing Presses, Hotels and Lodging Houses, places of entertainment and Massage Parlours.



A major part of the work of the Inspectorate is the investigation of numerous complaints from the public regarding various health nuisances. Once the genuineness of the complaint is established, necessary action is taken to abate or minimise the nuisances. In this connection the total number of primary visits and revisits for the year 1964 was 44,367. Table 25 (1) gives a summary of complaints received.

TABLE 25 (1) SUMMARY OF NATURE AND NUMBER OF COMPLAINTS RECEIVED FOR THE YEAR 1964

Nature of Complaints		City	Katong	Serangoon	Bt. Panjang/ Jurong	Total
Mosquito	...	662	148	78	54	942
Fly	...	75	38	18	20	151
Smoke	...	—	—	4	6	10
Smell	...	—	—	51	18	69
Drainage	...	—	—	71	29	100
Others	...	*639	224	89	29	981
Total	...	1,376	410	311	156	2,253

\* In the City this includes Smoke, Smell and Drainage complaints.

Housing: Building industry has been in full swing both in the City and Rural areas of Singapore. The Housing and Development Board also completed over 10,000 units during the course of the year.

In connection with building and planning, this Branch inspected and checked over 634 layouts and permits, stating requirements and giving comments from the health point of view. A total number of 205 planning consultations were handled by the Branch. A summary is shown in Table 25 (2).

TABLE 25 (2) NUMBER OF BUILDING PLANS AND PLANNINGS CONSULTATIONS HANDLED BY THE BRANCH FOR 1964

		City	Katong	Serangoon	Bt. Panjang/ Jurong	Total
No. of building plans dealt with	...	297	84	83	121	585
No. of planning consultations dealt with	...	115	27	39	24	205
No. of housing permits dealt with	...	—	23	26	—	49
No. of homes inspected in connection with environmental sanitation	...	2,139	932	9,252	6,620	18,943

(b) *Water Supplies.*—The main source of water supply for use of population throughout the Island is piped water.

Water rationing in the State of Singapore was lifted on 29th February, 1964 following heavy rainfall at the beginning of 1964.

Standpipes continued to be erected and are conveniently situated in kampongs, so that a wholesome and pure water supply for drinking and cooking is available. By the end of 1964 a total of 2,510 standpipes were in use throughout the island. Water supply to the public through the standpipes is free to the consumers and was made a public charge costing the Department \$1,587,350 for the year 1964.

Well water is the main source of water supply in the kampongs and in the more remote areas of the islands. Wells have been constructed in many areas by the Government. In areas where drainage has been constructed as anti malarial measures "anti malarial" wells provide a relatively safe water supply. However, the provision of adequate wholesome water supply for the islands continues to be a problem.

(c) *Licensed Premises.*—The issuing of all new licences is considered and approved by the Licensing Policy Committee. In addition, all problems pertaining to licensing are directed to this Committee for consideration and recommendation. The Public Health Inspectorate make regular visits to all licensed premises to ensure that satisfactory health standards are maintained.

#### INSPECTION OF LICENSED PREMISES BY THE PUBLIC HEALTH INSPECTORATE, 1964

		City	Katong	Serangoon	Bt. Panjang/ Jurong	Total
Sauce Factories	...	139	113	49	38	339
Oil Mills	...	120	32	16	47	215
Sawmills	...	84	31	7	107	229
Smoke Observations		13	12	—	3	28
Places of Entertainment	...	546	114	94	90	844
City Markets/ Private Markets	...	117	—	—	—	117
Grinding Mills	...	66	73	23	64	226
Gold Smiths	...	17	—	—	—	17
Printing Presses	...	667	64	2	8	741
Licensed Premises		21,848	657	5,491	2,871	30,867
Unlicensed Premises		—	528	154	126	808
Public Houses	...	454	473	223	149	1,299
Hotels and Native Passenger Lodging Houses	...	361	122	7	—	490
Inspecting Notices		124	—	—	—	124
No. of visits paid in cautionary cases	...	39	—	—	—	39
Serving Notices	...	66	—	—	—	66
Piggeries	...	—	—	956	—	956
Other Premises	...	8,538	669	628	271	10,106
Total	...	33,199	2,888	7,650	3,774	47,511

Table 25 (3)

## NUMBER OF LICENSED PREMISES

		City	Katong	Serangoon	Bt. Panjang/ Jurong	Total
Eating House	...	774	210	200	101	1,285
Restaurant	...	349		19	20	388
Coffee Shop	...	129	11	12	7	159
Iced Water and Cold Drinks	...	25	7	—	—	32
Soda Fountain	...	2	—	—	—	2
Meat Shop	...	106	24	33	8	171
Possession of Wild Boar Meat	...	4	—	—	—	4
Milk Bar	...	2	2	2	—	6
Aerated Water Factory	...	12	1	1	—	14
Bakery	...	40	22	19	4	85
Biscuit Factory	...	5	1	1	—	7
Cake Shop	...	38	—	9	2	49
Ice Cream Factory		9	—	—	—	9
Ice Popsicle Manufactory	...	—	—	—	—	—
Syrup Making Shop		5	3	1	2	11
Sweets Making Shop		12	1	2	—	15
Margarine Factory		2	—	—	—	2
Confectionery	...	6	4	—	4	14
Food Shop	...	48	2	40	—	90
Food Caterer	...	1	—	—	—	1
Dairy Shop	...	—	—	—	—	—
Ice Cream Distribution	...	4	6	19	5	34
Soya Bean Milk Factory	...	2	—	3	1	6
Manufacturing and Bottling of Orange Squash		1	—	—	—	1
Manufacturing and Bottling of non- carbonated drinks		—	—	—	2	2
Mono-sodium Glutamate	...	—	—	—	1	1
Milk Vendor	...	—	—	—	1	1
Pasteurising and Packing Milk Plant	...	—	—	—	3	3
Vegetable Shop	...	—	—	—	3	3
Vermicelli Factory		—	—	—	2	2
Total	...	1,576	294	361	166	2,397

Table 25 (4)

## NUMBER OF LICENSED PREMISES IN SOUTHERN ISLANDS

Eating House	...	26
Restaurant	...	1
Meat and Ice Cream Shops	...	2
Fruit Shops	...	3
Vegetable Shops	...	2



(d) *Offensive and Dangerous Trades.*—Offensive and Dangerous Trades are now governed by sections 80, 81 and 132, 133 of the Local Government Integration Ordinance of 1963. These laws provides for sanitary requirements, adequate lighting, ventilation, drainage, adequate and wholesome water supply and satisfactory safeguards to meet occupational hazards.

In the City area the Dangerous Trades were licensed by the Chief Fire Officer whilst in the Rural area this was done by the District Health Officers. However, with the passing of the Local Government Integration Ordinance the Dangerous Trades mentioned in the Second Schedule came fully under the control of the Chief Fire Officer as from 1st September, 1963. The licensing of Offensive Trades mentioned in the First Schedule continues to be the responsibility of the Ministry of Health.

Table 25 (5)

## LIST OF LICENSED PREMISES FOR OFFENSIVE TRADES 1964

Nature of Licence	Total No. of Licensed Premises				Total
	City	Katong	Serangoon	Bt. Panjang/ Jurong	
Blachan Store ...	3	—	—	—	3
Brick Kiln ...	2	1	—	10	13
Coffee Roasting Factory ...	8	6	2	2	18
Dye House ...	1	—	—	—	1
Drying and Sorting Fish ...	1	—	—	—	1
Fruit Preserving ...	—	1	2	2	5
Laundry ...	309	98	66	26	499
Oil Mill ...	13	2	6	6	27
Refining Precious Metals by Acid Process ...	7	—	—	—	7
Sago Factory ...	7	—	1	5	13
Sauce Factory ...	16	—	8	2	26
Sauce Mixture Factory ...	2	6	—	—	8
Sheep and Goat Pen ...	1	2	1	1	5
Soap Boiling ...	8	5	4	4	21
Sugar Boiling ...	3	—	1	—	4
Tannery ...	2	—	5	—	7
Slaughter House ...	—	2	—	—	2
Private Markets ...	—	—	6	—	6
Importation of Meat ...	13	—	—	—	13
Cattle Shed ...	—	5	29	15	49
Lime Making ...	—	6	—	—	6
Rattan Store ...	—	—	—	2	2
Grinding Mill ...	—	8	8	7	23
Pottery Works ...	—	—	—	3	3
Fertiliser Factory ...	—	—	1	—	1
Canneries ...	—	—	—	2	2
Piggery ...	—	465	418	729	1,612
Sick Receiving House ...	3	—	—	—	3
Miniature Zoo ...	—	—	1	2	3
Total ...	399	607	559	818	2,383



Table 25 (6)

## LIST OF DANGEROUS TRADES LICENSED IN RURAL AREAS 1964

Nature of Licence	Total No. of Licensed Premises			
	Katong	Serangoon	Bt. Panjang/ Jurong	Total
Attap Store ...	24	25	17	66
Timber Yard, Sawmill, Furniture Shop ...	38	44	39	121
Firewood Store ...	16	49	10	75
Charcoal Store ...	13	31	6	50
Calcium Carbide Store	7	2	3	12
Petroleum Store ...	27	37	37	101
Kerosene Store ...	1	—	3	4
Fire Cracker Store ...	27	3	4	34
Smithy/Foundry ...	2	4	4	10
Rubber Smoke House	2	18	3	23
Rubber Factory ...	—	3	—	3
Garage ...	23	36	20	79
Others ...	—	22	12	34
Total ...	180	274	158	612

*Footnote:*—Southern Islands have 1 smelting work, 4 Petroleum Installation and 3 Open air cinemas (not included in above table).

(e) *The Cleansing Service.*—This important service functions on a district basis and is provided by the City Cleansing Department for the City Area and Rural District Health Departments for the rest of the State.

These services include (1) cleansing of public streets and drains daily; (2) the removal of domestic and trade refuse from premises; (3) the flushing of main streets and drains; (4) the disposal of refuse by controlled tipping and incineration; (5) the supervision of cleansing outlet drains carried out by Contract Labourers; and (6) the removal of nightsoil from premises not yet sewered.

In the City area daily removal of refuse is carried out from houses and business premises along main roads, public streets and housing estates. Refuse collected is either domestic or trade refuse. The collection and disposal of domestic refuse is carried out free of charge but owners of trade premises are levied a charge for the service.

In the Rural area the removal of refuse is done daily from domestic houses and business premises along the main roads, gazetted streets and housing estates. Domestic refuse is removed and disposed of free of charge but trade refuse removal is carried out for a levy. A considerable number of kampongs are provided with Labourers to maintain skeleton cleansing services.

*Street Watering.*—Three street watering vans of 1,000 gallons capacity each were used for watering and washing principal streets whenever necessary.

47 steel handcarts fitted with meters, hoses, etc., were also used for flushing roadside and backlane drains,

The amount of water consumed during the year was 2,431,700 gallons by water vans for street watering and 65,198,100 gallons by flushing handcarts for flushing streets, backlanes and culverts.

*Incinerator.*—Combustible refuse amounting to 320 tons were delivered to Kolam Ayer Incinerator by departmental and other vehicles during the year for destruction by incineration.

*Controlled Refuse Tip.*—During the year incombustible refuse amounting to 174,396 tons was delivered to the controlled tip at Kolam Ayer Lane by departmental and other vehicles for disposal.

Table 25 (7)

REFUSE DISPOSED OF AT INCINERATOR AND CONTROLLED DISPOSAL  
FOR THE CITY AREA — 1964

*Combustible Refuse Disposed of at Incinerator*

	Tons	Tons
Departmental (Domestic and Trade Refuse and Sweeping)		
Other Sources	320	320

*Incombustible Refuse Disposed of at Controlled Tips*

Departmental:			
Domestic and Trade Refuse and Sweepings	...	77,377	
Drain Refuse and Sweepings	...	67,946	
District Councils — Domestic Refuse etc.	...	10,580	
Other Sources	...	18,493	
		<hr/>	174,396
Refuse collected by the department from Storm Drains used for filling low lying land, etc.	...	—	—
		<hr/>	<hr/>
Total	...		174,716

Table 25 (8)

AVERAGE NUMBER OF BINS OF REFUSE EMPTIED DAILY  
FOR THE CITY AREA 1964

		From Dwelling Houses	From Business and Trade Premises	Total
By Wagons	...	31,130	18,671	49,801
By Handcarts	...	12,406	2,062	14,468
		<hr/>	<hr/>	<hr/>
Total	...	43,536	20,733	64,269

Table 25 (9)

COLLECTION OF REFUSE IN RURAL AREAS 1964

		Katong	Serangoon	Bt. Panjang/ Jurong	Total
Number of houses	...	14,771	19,970	3,703	38,444
Amount of Refuse collected in tons	...	22,536	22,400	9,150	54,086
No. of bin centres	...	64	92	45	201
No. of street bins	...	751	800	387	1,938



Table 25 (10)

## EXPENDITURE ON COLLECTION OF DOMESTIC AND TRADE REFUSE, STREET AND DRAINS CLEANSING AND DISPOSAL—CITY AREA—1964

Year	Labour Wages	Population (City Area)	No. of Assessed Buildings	MILEAGE OF		Tonnage	Cost Per ton
				Streets and Roads	Back-Lanes		
	\$						\$
1964 .. ..	3,705,152	1,128,700	96,242	259.4	40.5	145,323	25.49

*Conservancy Service.*—During the year under review, 5,366,496 pails of Nightsoil collected by the City Cleansing Department from 15,102 latrines in 12,034 houses were disposed of at the three Nightsoil Disposal Stations, i.e. Albert Street, Peoples Park and Paya Lebar.

Table 25 (11)

## COLLECTION AND DISPOSAL OF NIGHTSOIL IN THE CITY AREA — 1964

Year	Expenditure	No. of Vans	No. of Pails collected	Average Gross Cost per month per pail on collection and disposal
1964	\$1,332,670	40	5,366,496	25 cents

The figures for removal of nightsoil in Rural Areas are shown in Table 25 (12).

Table 25 (12)

## NIGHTSOIL COLLECTION IN RURAL AREAS — 1964

No. of Pails removed during the year 1964					
		Katong	Serangoon	Bt. Panjang/ Jurong	Total
No. of pails removed by Contractors	...	1,388,067	470,200	201,300	2,059,567
No. of pails removed departmentally	...	1,072,090	1,230,500	479,826	2,782,416
Total	...	2,460,157	1,700,700	681,126	4,841,983

The nightsoil collected in Rural districts is disposed of by the following methods: (a) trenching, (b) Ulu Pandan Sewage Works (Bt. Panjang/Jurong District), (c) Paya Lebar Nightsoil Pumping Station (Serangoon and Katong Districts).



*Public Conveniences.*—The City Cleansing Department cleansed and maintained 92 public conveniences situated at various parts of the City.

Similar service was also rendered in the rural districts.

*Aluminium Portable Latrines.*—Portable aluminium latrine structures were hired out to organisers of wayang performances, etc. and the hiring and services fees collected amounted to \$10,408.

Approved type refuse carrier bins were also hired out at the same time and the hiring and services fees collected amounted to \$12,190.

At present 29 aluminium portable latrine structures are available for hire from the various nightsoil stations.

(f) *Kampong Sanitation.*—This work is carried out by the Public Health Engineering Unit under the charge of the Public Health Engineer. The nature of the work carried out includes improvement to existing drainage of kampongs and standpipes, construction of public latrines, wells and repairs to stand-pipe aprons.

Table 25 (13)

KAMPONGS SANITATED DURING 1964

		City	Katong	Serangoon	Bt. Panjang/ Jurong	Total
No. of kampongs where sanitation is maintained	...	18	15	16	9	58
No. of new kampongs sanitated	...	1	—	12	3	16
		—	—	—	—	—
Total	...	19	15	28	12	74
		—	—	—	—	—

FOOD HYGIENE AND THE CONTROL OF THE SALE OF FOOD AND DRUGS

The Food and Drugs Section operates on an island wide basis and is responsible for maintenance of food hygiene standards and for the control of the manufacture, storage, preparation and sale of food and drugs, under the Food and Drugs Ordinance (Cap. 148) and the regulations made thereunder. Samples of food and drugs taken are analysed for quality to ensure compliance with standards laid down in the Ordinance. Prosecution is instituted when necessary.

In 1964, 1,436 samples of food and drugs and cosmetics were submitted by the Food and Drugs Inspectorate for analysis and/or examination. Another 667 samples of food and other specimens were taken by the rest of the Public Health Inspectorate, making a total of 2,103 samples for the year. A breakdown of the above figures is given in Table 26 (1a).

Table 26 (1a)

<i>Type of Samples</i>	<i>No. Taken</i>	<i>Type of Samples</i>	<i>No. Taken</i>
Formal Food		Informal Drugs (Analyst)	
Coffee Mixture	151	Cough Mixture	9
Honey	10	Medicated Oil	10
Groundnut Oil	21	Hair Darkener	1
Jam	5	Hair Restorer	1
Syrup with Vitamin C	39	Multivitamins	3
Chilly Sauce	14	Fever Powder	2
Coffee and Chicory	2	Hair Oil	1
Kaya	4	Multivitamin Syrup	1
Popsicles	1	A.P.C. Tablets	2
Sauce Colouring Agent	1	Eye Lotion	1
Ghee substitute	1	Anti-Cholera Vaccine	1
Aerated Water	53		— 32
Cream	9	Informal (Bacteriologist)	
Margarine	29	Ice-Cream	335
Syrup and Cordials	30	Popsicles	275
Coriander Powder	9	Condensed Milk	2
Rice Vinegar	3	Well Water and others	3
Coffee and Coffee Powder	5		— 615
Whisky	9	(Analyst)	
Bacon	9	Trade Effluent and	
Vinegar	6	Tap Water	3
Essence of Chicken	1		— 3
Ghee	11	Drug Informant (Toxicologist)	
Sauce Imported	12	Eye Lotion	2
Butter	40	Fever Powder	1
Chilly Powder	27		— 3
Milk (Fresh)	31	Formal Drugs	
Tomato Sauce	6	Medicated Oil	20
Tea	22	Hair Restorer	2
Soya Bean Sauce	32	Tincture of Iodine	13
Iced Water	46	Ointment	9
Soya Bean Cake	47	Hydrogen Peroxide	5
Still Drinks	6	Vitamin A Capsules	19
Noodles and Vermicelli	20	Vitamin B1 Tablets	17
Sweet Meat (Char Siew)	49	Fever Powder	18
Tea Dust	3	A.P.C. Tablets	19
Coloured Sugar	1	Aspirin	2
Curry Powder	4	Vitamin B	1
Coloured Cakes	4	Eye Lotion	1
Apples	10	Vitamin Tablets	2
	— 783	Hair Darkener	10
		Tr. of Benzoin	2
		Proprietary Drugs	1
		Hair Spray	2
			— 143

Table 26 (1a) — continued

<i>Type of Samples</i>	<i>No. Taken</i>	<i>Type of Samples</i>	<i>No. Taken</i>
Informal Food (Analyst)		For identification only	
Coloured Skimmed and		Food Contamination Informal	
Buttermilk Powder	59	(Bacteriologist)	
Star Aniseed	20	Sweet Cigarettes	1
Cooking Oil	8	Condensed Milk	3
Vegetable Shortening	1	Fresh Milk	10
Cheese	24	Reconstituted Milk	6
Cream	2	Chocolate Milk	5
Coffee and		Flavoured Milk	3
Coffee Powder	15	Milk	12
Dried Snow Frog	9	Cockles	6
Essence of Chicken	2	Cooked Duck	2
Honey	2	Cooked Canned Ham	8
Fruits	81	Tinned Cooked Ham	16
Sesame Oil	1	Tinned Vegetables	4
Coffee Mixture	1	Still Drinks	6
Pure Groundnut Oil	2	Mushroom	2
Chilly Sauce	4	Abalone	3
Sausages	7	Rice contaminated	
Saukraut	10	with stain	1
Rice	1	Sacking for rice	1
Sugar	1	Iced Water	4
Grape Drink	1		— 93
Carbonated/Non		Food Poisoning	
carbonated drinks	19	Informal (Bacteriologist)	
Baking Powder	1	Remnant of Chicken	1
Colouring Matter	7	Fish (Ikan Merah)	1
Sweetened Ice Water	10	Dried Cooked Fish	1
Powder Milk	1	Shredded Dried Pork	1
Whey Milk Powder	3	Chicken Soup	
Canned Milk	1	with Mushroom	1
Still Drinks	18	Cooked Ham	1
Soya Bean Cake		Bread	1
(Tow Kuah)	35	Kaya	1
Sweet Meat (Char Siew)	15	Cooked Food remnants	1
Sauce	1	Pepper	1
Potatoes	4	Black Vinegar	1
Tinned Vegetables	4	Cold Cooked Duck	3
Black Currant Extract	1	Sea Anemone	1
Coloured sugar	3	Cooked Chicken and	
Jelly	1	Duck Giblets	1
Coloured cakes	3	Canned Abalone	1
Margarine	1	Cold Jellied Mutton	1
Black Currant Pastilles	1	Soya Bean Curd	2
Drinks in		Cold Cooked Chicken	2
Powdered Form	6	Cold chicken in Sauce	6
Canned Arbutus		Almond Jelly	1
in Syrup	1	Salt	2
	— 387	Grated Coconut	1
		Malay Cakes	
		(Kueh Lapis)	1
Food Contamination (Analyst)		Bread	1
White granulated		Kaya	1
substance	1	Vomit	1
	— 1	Nasi Lemak	2
		Cocoanut Milk	1
For identification only		Tow Sar Pow	1
Botanic Gardens		Fried Fish	1
Seeds	1	Pork and Vegetable	
	— 1	in Gray	1
			— 42



Table 26 (1b)  
SUMMARY OF SAMPLES TAKEN DURING 1964

		To Analyst	To Bacterio- logist	To Toxi- cologist	To Univer- sity of Singa- pore	To Botanic Gardens	Total
Food	...	1,172	610	—	—	1	1,783
Well water, tap water and others	...	3	3	—	—	—	6
Drugs	...	175	—	3	—	—	178
Food Poisoning	...	—	42	—	—	—	42
Food Contamination	...	1	93	—	—	—	94
Total	...	1,351	748	3	—	1	2,103

During the year, 92,232 lbs. of unsound food were condemned and destroyed as unfit for human consumption. In all 229 prosecutions were carried out resulting in 227 convictions and a total of \$15,370 in fines.

*Food Establishments.*—A total of 2,397 food establishments in the City and Rural Areas were inspected by the Public Health Inspectorate in connection with the preparation, storage, manufacture and sale of food. The distribution of these premises is given in Table 26 (2).

Table 26 (2)  
LICENSED FOOD ESTABLISHMENTS IN SINGAPORE 1964

		District Councils				Total
		City	Katong	Serangoon	Bt. Panjang/ Jurong	
Coffee Shop	...	129	11	12	7	159
Eating House	...	774	210	200	101	1,285
Restaurant	...	349	73	19	20	388
Others (Food Bye-laws)		324		130	38	565

### *Ice-Cream*

Table 26 (3)  
LICENSED ICE-CREAM FACTORIES, DISTRIBUTION CENTRES AND  
CONFECTIONERIES 1964

Number of Ice-Cream Factories	...	9
Number of Distribution Centres	...	34
Number of Confectioneries	...	14
Total	...	57

*Ice-Cream Samples for Bacteriological Examinations.*—During the year a total of 610 samples of ice-cream and popsicles were taken for bacteriological examinations. Of these 41 were unsatisfactory.

190 employees of all ice-cream factories and distribution centres were examined for typhoid carrier state in Middleton Hospital.

*Labellings.*—Investigations into the contravention of labelling regulations were continued during the year. When these contraventions were detected warning letters were sent to those concerned, drawing attention to the nature of infringement and a time limit for rectification of the infringement was imposed.

*Food Poisonings.*—There was a serious outbreak of food poisoning during July 1964, involving 207 persons. The incriminating food was found to be coconut milk for *nasi lemak*, which was contaminated with arsenic.

During the year there were 31 confirmed reported outbreaks of food poisoning involving a total of 311 persons. In the majority of cases, the causative agent appeared to be of bacterial origin due to improper storage, preparation and handling of food. In a number of cases the specific organism could not be ascertained as no food remnants were available for examination.

#### MALARIA CONTROL AND MOSQUITO CONTROL

*General.*—Anti-malarial and anti-mosquito measures are still carried out on “City” and “Rural” basis, i.e. by the Health Officer, A.M.D. in the City area and by the District Health Officers in the Rural Districts respectively.

The main method of malarial control is the use of anti-larvæ measures against the two main vectors *A. sundanicus* and *A. maculatus*. This entails subsoil drainage, construction of permanent surface drains, ditching and weekly anti-malarial oiling including the use of insecticides.

The construction of permanent anti-malarial works is carried out by the Public Health Engineering Unit.

Close liaison was also maintained between the department and the Armed Forces, Railway Administration, Port of Singapore Authority and the Malaria Advisory Board of Malaya.

*Malaria.*—All cases of malaria occurring in Singapore which were reported to S.H.O. (Quarantine and Epidemiology) by hospitals, Government’s outdoor dispensaries and other private sources, were carefully investigated by the Quarantine and Epidemiology Branch.

Eight cases of malaria were reported in Pulau Tekong Island under the jurisdiction of Katong District. These cases occurred in kampongs which were in “uncontrolled” areas. Breeding of malaria vectors was revealed as a result of field surveys. The outbreak was controlled with chemoprophylaxis and the areas concerned were brought under weekly anti malarial oiling.

Thirty-three cases of malaria were reported in the Fuyong area of Bukit Panjang District. This outbreak was the largest reported for many years and of this number of people only four persons had definite histories of having been to Johore area in the two weeks prior to the outbreak. Larvæ surveys revealed breeding of *A. maculatus* breeding in the ravines in the nature reserve by the side of the Housing and Development Board Quarry and in the “face” of the Singapore Granite Quarry Ltd. and also at the jungle ravine near the Kramat Habib Ismail, 8½ m.s. Bukit Timah Road. The vector concerned is the *A. maculatus* in this outbreak.



With the integration of Government and City Council, the Anti-malaria Oilers of the district had refused to clear the drains, a preliminary step towards the effective oiling of these drains. This resulted in intense breeding of *A. maculatus* and so set the stage for the transmission of the disease.

Investigation of all fever cases reported in the area together with blood films for malaria parasite of all persons immediately around the reported cases of malaria were taken.

The malaria parasite transmission were interrupted by use of mass drug administration involving about 4,000 of the population in the area. Residual spraying of about 690 houses and swing fogging of the out houses and the ravine were also done. Drainage labourers were deployed from other areas to clear all overgrown drains and this was followed by heavy anti-malarial oiling. The outbreak was brought under control effectively.

Table 27 (1)

## 1,000 Consecutive Collections from Common Breeding Places in the City

Public Roadside concrete drains	...	450
Concrete sullage drains	...	31
Backlane concrete drains	...	11
S.I.T. concrete drain	...	8
Septic tanks	...	7
Edges of Reservoir border	...	9
Leaf Axils	...	12
Edge of river	...	2
Concrete pond	...	9
Fish pond	...	8
Earth pond	...	3
Concrete pit	...	4
Concrete tank	...	1
Concrete well	...	5
Water cork pit	...	12
Boat	...	8
Sewerage Excavation	...	4
Silt trap	...	3
Earth pool	...	8
Building excavation	...	11
Seepages	...	4
Earth drains	...	22
Lorry track	...	8
Hyacinth pond	..	9
Grassy pool	...	7
Vegetable	...	4
Earth well	...	11
Stagnant Water	...	210
Water bearing receptacles (tyres, tins, bottles, kwali, etc.)	...	119
Total	...	<hr/> 1,000 <hr/>



*Notices.*—A total of 172 notices under the Destruction of Mosquitoes Ordinance were served. The majority of these were served on owners of lands or contractors who were responsible for building excavations in which mosquitoes were found breeding.

Table 27 (2)

City	...	27
Katong	...	47
Serangoon	...	64
Bt. Panjang/Jurong	...	34
Southern Islands	...	—
Total	...	<u>172</u>

*Anti-Mosquito Control.*—Throughout the year, anti-mosquito control was maintained through (a) Permanent measures, (b) non-permanent measures.

(a) *Permanent Measures.*—These include:

- (i) Construction of permanent concrete drains, subsoil drains and earth drains. With the construction of subsoil drains, a number of “anti-malarial” wells were constructed providing the population in those areas a safe water supply.
- (ii) Maintenance and repair of existing anti-malarial drains. This was done in both Rural and City Areas.
- (iii) Control of tidal areas. This consists of filling of extensive tidal swamp areas by controlled tipping. Large areas in Kolam Ayer and in the Kallang Basin are continuing to be filled. Where malarial vectors have been discovered in fish and prawn ponds, owners have been advised to empty their ponds daily with the tides.

(b) *Non-Permanent Measures.*—These are mainly larvicidal measures. During the year under review a total of 337,701 gallons of anti-malarial oil was used.

Table 27 (3)

## AMOUNT OF ANTI-MALARIAL OIL USED IN GALLONS

City	...	102,868
Katong	...	93,851
Serangoon	...	55,100
Bt. Panjang/Jurong	...	44,935
Southern Islands	...	9,579
Jurong Industrial Estate	...	31,368
Total	...	<u>337,701</u>

*Anti-Malarial Measures at Jurong Industrial Site.*—Oiling was introduced in January 1962 following 9 mosquito surveys carried out in October and November 1961. There were 13 collections of *A. sundaicus* and 2 collections of *A. Letifer*, from these mosquito surveys. Control measures were planned to cover:

- (a) the catchment of S. Jurong, from the causeway northwards to Jurong Road and
- (b) the other areas where civil engineering and development works are proceeding, especially from 16 m.s. Boon Lay Road to Tanjong Kling.

Throughout 1964, 34 mosquito surveys were made, and there were no collections of dangerous anophelene species.

The Anti-Malarial team has kept track with the progress of all civil engineering works, which produce seepages, stagnant pools and blocked outlets. These have been covered with a heavy oiling programme, and 26,880 gallons of A.M. oil were used.

The overall supervision of these measures is done by the Public Health Engineer, assisted by a Super Scale Technical Subordinate.

#### GENERAL

(1) *Cholera.*—During the year there were 3 outbreaks of cholera, as follows:

- 1st Outbreak — Period 30th January, 1964 to 3rd February 1964 — 3 cases with no deaths
- 2nd Outbreak — Period 13th April, 1964 to 27th June, 1964 — 20 cases with 3 deaths
- 3rd Outbreak — Period 27th August, 1964 — 1 case with no death.

Throughout these outbreaks, the Public Health Inspectors, immediately on notification of each individual case, carried out house to house investigations in the area affected to look for suspected cases. Those people who had not been inoculated, were also advised to have inoculations.

Environmental sanitation was also carried out. This involves the spraying of the area with gammexane and disinfecting of all bucket latrines with Jeyes' fluid. All accumulations of refuse were removed by the City Cleansing Department and hawkers were cleared from the affected areas by the Markets and Hawkers Department.

In the Rural areas spraying of pigsties and poultry runs was also done and wells were treated with chlorine.

The placing of premises, where the cases have occurred, under quarantine and the removal of contacts to St. John's Island were carried out by the Public Health Inspectorate.

(2) *Offences and Prosecutions.*—City —During the year, 323 summonses were applied for all types of infringements of the Ordinances, Regulations and Bye-laws. There were 229 prosecutions with 227 convictions. 11 summonses were not served and 88 summonses were withdrawn in Court. Total fines amounted to \$15,370.

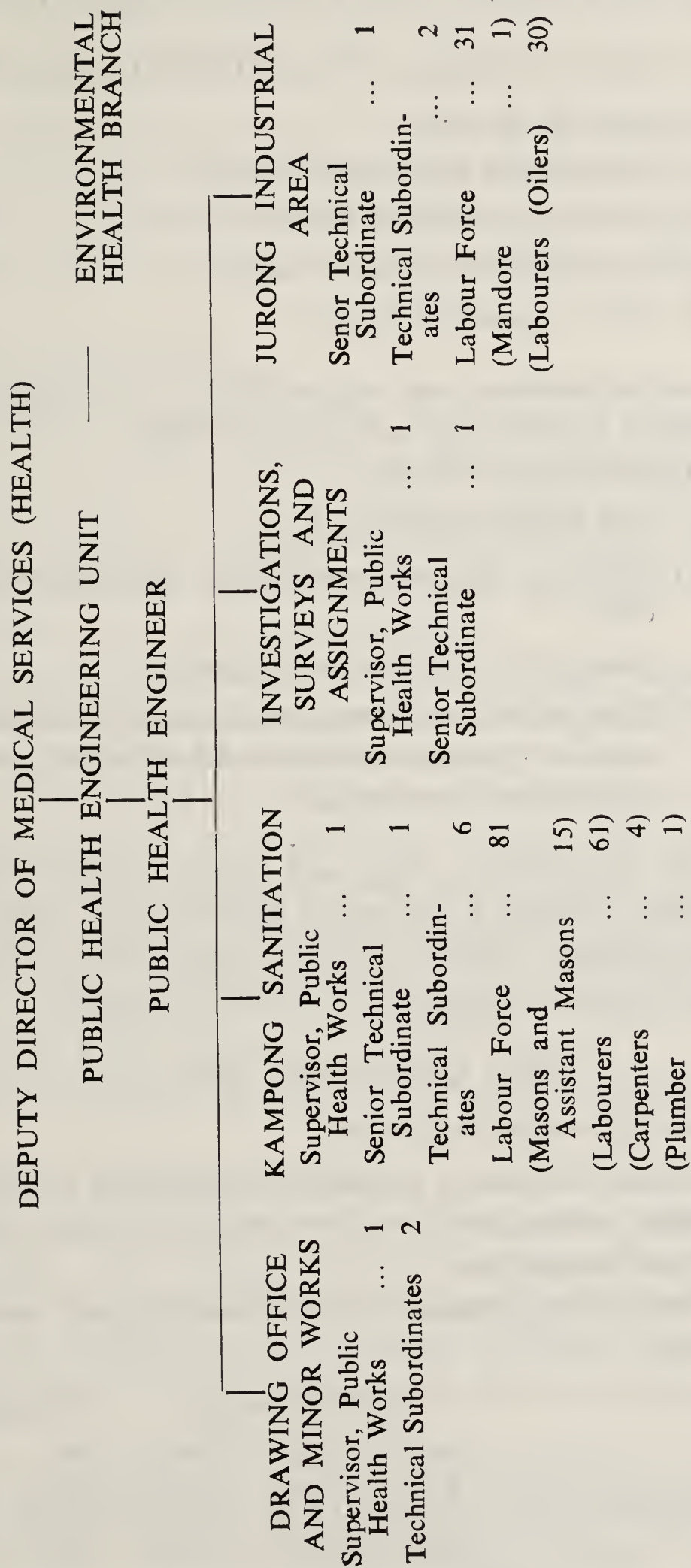
The following table 28 (1) shows the number of offences and prosecutions in the Rural Districts.

Table 28 (1)

		Offences	Prosecutions
Katong	...	8	8
Bt. Panjang/Jurong	...	—	—
Serangoon	...	1	1
Southern Islands	...	—	—
		—	—
Total	...	9	9
		—	—



ORGANISATION CHART OF THE PUBLIC HEALTH ENGINEERING UNIT (JUNE 1964)



## 8. QUARANTINE AND EPIDEMIOLOGY BRANCH

THIS Branch is under the charge of a Senior Health Officer and comprises of:

### I. The Quarantine Section —

- (1) The Marine Port Health Service;
- (2) The Airport Health Service;
- (3) The Quarantine Station; and
- (4) The Vaccination Centre.

These four sub-sections are responsible for the control of dangerous infectious diseases by checking international traffic.

### II. The Epidemiology Section —

- (1) The Plague Prevention Unit;
- (2) Infectious Disease Investigation and Epidemiological Studies Unit;
- (3) Health Service to the Islands; and
- (4) The Aedes Control and Anti-Malarial Surveillance Unit which runs the Central Anti-Malarial Laboratory and also assists in establishing New Projects.

These four sub-sections study and control minor infectious disease conditions locally, establish non-receptive conditions for Yellow Fever around Airport, and maintain a regular check on rodent health in the Port area to discover the first signs of plague if and when introduced.

### THE QUARANTINE SECTION

#### (1) *The Marine Port Health Service*

Round-the-clock clearance of ships is progressing successfully.

Radiomedical advice for ships at sea involved 74 cases this year. This is also a round-the-clock service.

The following is a summary of work done by this sub-section for the past three years:

		Number of Vessels			Passengers and Crews		
		1962	1963	1964	1962	1963	1964
Foreign going vessels	..	2,080	3,024	2,598	135,307	177,553	132,171
Small craft	..	10,260	15,730	12,652	64,581	63,740	35,474

Sanitary inspection of six water-boats and 66 bum-boats was carried out. Of 346 ships examined, 69 were required for fumigation and certificates were issued accordingly.



The reduction in foreign going vessels was due to Indonesia's policy of confrontation, and in smallcraft was due to Malaysia's ban on them since August 1964. The disproportionate fall in smallcraft crew and passengers was due to their wish to load their boats with as much food as they could in Singapore.

On 10th August, 1964 Port Health launches were withdrawn for defence purposes. As a consequence, the four Port Health Inspectors formed a round-the-clock roster in combination with Immigration and Customs officials, while the Port Health Officers dealt with passenger ships and special problems.

## (2) *The Airport Health Service*

1964 marked the completion of the New Airport Terminal Building which was occupied on 30th April, 1964, in preparation for aircraft clearance after midnight that day, and was officially opened on 2nd May, 1964. Domestic flights continued to be cleared in the Old Terminal Building up to 30th June, 1964. The New Terminal Building is providing separate arrival and departure areas and a direct Transit Lounge.

The Paya Lebar International Airport is a sanitary airport under the terms of Article 19 of the International Sanitary Regulations. During the year, 15 Airlines availed themselves of the facilities provided at the Airport. There were 8,530 scheduled aircraft arrivals and 8,530 departures on international flights. Round-the-clock service for the clearance of aircraft and passengers from "infected" airports have been provided by four senior Hospital Assistants, with the assistance of an extra Hospital Assistant during peak hours. Four private operators (S.V.O.C., Shell, Caltex and Pan American Indonesian Oil Company) also availed themselves of the facilities, while B.U.A. and Cunard Eagle Airlines ran trooping services.

The general sanitation of the Airport has remained satisfactorily throughout the year.

One complaint of mosquito nuisance was received from the Royal Singapore Flying Club in October 1964. On exhaustive investigation, only one breeding place (in a disused tyre in the Flying Club hangar) was discovered. Adult trapping showed no *Aedes aegyptic* or *A. albopictus*, showing there was no breakdown in the Aedes Sanitation Service. It will be noted that the quality of the anti-malarial oil was substandard during this time.

The volume of traffic and the number of passengers handled by the Airport Health Office over the last five years are given in the table below:

		1960	1961	1962	1963	1964
Aircraft from infected ports	..	1,325	1,641	1,917	3,223	3,057
Passengers and crew cleared	..	74,916	91,343	110,852	192,864	156,645
Passengers isolated	..	—	—	—	—	—
Passengers under surveillance	..	174	354	670	743	680



The fall in "passengers and crew cleared" is due to fact that 47,093 transit passengers from infected ports did not require to be cleared as they were sent direct to the Transit Lounge. There has been no significant decrease in number of passengers without valid vaccination certificates. This is a matter for concern as the world incidence of small-pox and cholera has been increasing since 1960.

*Examination of Toilet Wastes from Aircraft.*—The disinfection status is improving but not as much as would be desired.

### (3) *The Quarantine Station*

The table below shows the number of passengers quarantined at St. John's Island for the past five years:

Year	Total	Chinese	Indians	Malays	Others
1960	10,252	6,201	4,016	15	20
1961	10,615	5,496	4,754	302	63
1962	6,625	3,427	3,126	—	36
1963	4,228	832	3,224	155	17
1964	4,302	948	3,337	—	17

For the first time in many years, there has been no drop in the number of passengers quarantined in St. John's Island. Quarantine measures are limited to re-vaccination of all arrivals and observation for 48 hours.

During the outbreak of cholera in May and June and again in August and September, 127 and 24 contacts respectively were isolated in St. John's Island.

### (4) *The Government Vaccination Centre*

This Centre affords free vaccination service to the public and travellers. International vaccination certificates are also available here.

The following is the summary of the work done at this centre for 1962–1964.

#### Summary of work done at the Government Vaccination Centre 1962–1964

	1962	1963	1964
Small-pox Vaccinations ..	19,260	20,323	22,583
Cholera Vaccinations ..	20,973	173,146	33,679
TAB Vaccinations (Typhoid Paratyphoid A & B) ..	91	75	474
Total ..	40,324	193,544	56,736

## THE EPIDEMIOLOGICAL SECTION

### (1) *Plague Prevention Unit*

Rats, trapped along the Singapore River and in the Harbour Board area subjected to post-mortem examination and, if suspicious, bacteriological investigation. Rats obtained from fumigated ships are also subjected to post-mortem examination. A total of 2,940 rats were examined during the year and none of them was infected with plague.

(2) *Infectious Disease Investigation and Epidemiological Studies Unit*

Notifiable infectious diseases are divided into two broad categories under the Quarantine and Prevention of Disease Ordinance.

- (1) The dangerous infectious diseases, which are quarantinable, and include small-pox, plague, cholera, epidemic or louse-borne typhus and yellow fever.
- (2) The minor infectious diseases which include anthrax, endemic typhus, cerebro spinal fever, acute poliomyelitis, chicken-pox, diphtheria, enteric fever, erysipelas, leprosy, puerperal fever, scarlet fever and tuberculosis.

Table 29 shows the incidence of the main notifiable diseases from 1962 to 1964.

Table 29

		1962			1963			1964		
		City	Rural	Total	City	Rural	Total	City	Rural	Total
Cholera El Tor	..	..	..	..	15	12	27	16	8	24
Typhoid	..	65	45	110	123	66	189	76	53	129
Diphtheria	..	261	92	353	312	88	400	166	40	206
Chickenpox	..	1,372	652	2,024	1,746	765	2,511	853	417	1,270
Poliomyelitis	..	6	8	14	50	18	68	11†	6	17†
Cerebro Spinal Fever	..	..	..	..	..	..	..	..	..	..
Leprosy	..	69	43	112	75	33	108	89	47	136
Typhus*	..	..	2	2	1	3	4	..	1	1
Puereral Fever	..	40	7	47	15	3	18	85	29	114

\* Under the heading, typhus are included Tsutsugumushi or Scrub Typhus of Malaya (mite borne) and flea borne Urban Type Tropical Typhus. Louse-borne typhus has not been seen in Singapore.

† One imported case.

The figures for tuberculosis are not included in this report as tuberculosis (since 1959) is notified directly to the Assistant Director of Medical Services (Tuberculosis) at Tan Tock Seng Hospital.

*Cholera El Tor (Ogawa Strain).*—Following the two outbreaks in 1963, there were three outbreaks in 1964.

Between 30th January, 1964 and 3rd February, 1964 there were three cases. All recovered, and no carrier was discovered.



The next outbreak was from 13th April, 1964 to 27th June, 1964. Twenty cases occurred, with three deaths. Seven carriers were discovered.

The last outbreak occurred on 27th August, 1964 with just one case.

*Diphtheria.*—The morbidity figure is the lowest in recent years, while the mortality figure of 17 is just one more than the lowest reached in 1962. The local disturbances may have played a part in the mortality picture as some of the cases admitted thereafter were quite advanced and in a serious condition.

This is the third year since the operation of compulsory vaccination. Public response is still not as good as expected.

The Urban/Rural distribution in 1964 was 166 : 40, as compared with 312 : 88 in 1963. The table below gives the monthly notifications of diphtheria in 1964.

Table 30 showing the distribution of diphtheria by month and locality, 1964.

Table 30

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Urban ..	21	16	14	16	8	11	13	14	7	13	19	14	166
Rural ..	6	2	2	4	1	..	2	7	2	5	3	6	40
Total ..	27	18	16	20	9	11	15	21	9	18	22	20	206

Table 31 showing comparative monthly incidence of diphtheria for 1962, 1963 and 1964.

Table 31

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1962 ..	41	26	36	36	35	21	34	34	26	15	18	31	353
1963 ..	36	35	32	23	19	31	53	30	27	47	38	29	400
1964 ..	27	18	16	20	9	11	15	21	9	18	22	20	206

Table 32 showing diphtheria notifications and deaths for the last ten years.

Table 32

Year	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Notifications ..	460	552	712	548	519	642	587	353	400	206
Deaths ..	41	47	58	34	23	32	27	13	24	17
Mortality Rate	8.91	8.51	8.14	6.20	4.43	4.98	4.60	3.68	6.00	8.25



*Poliomyelitis*.—The remarkable record of 1962 (14 cases) has been exceeded by only three (including one imported) cases this year, following the policy of repeating Sabin dosage three or more times if possible.

Table 33 shows the monthly incidence of poliomyelitis for 1964.

Table 33

Poliomyelitis 1964	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
City ..	4	..	3	1*	..	..	..	..	..	1	..	2	11*
Rural ..	3	..	..	1	..	2	..	..	..	..	..	..	6
Total ..	7	..	3	2*	..	2	..	..	..	1	..	2	17*

\* One imported case.

Table 34 shows the incidence of notified and confirmed cases of poliomyelitis by age, sex and ethnic group in Singapore, 1964.

Table 34

Age	EUROPEANS			EURASIANS			CHINESE			MALAYS			INDIANS			OTHERS			TOTAL		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Under 1 year	..	..	..	..	..	..	2*	1	3*	1	..	1	..	..	..	..	3*	1	4*	..	..
Over 1 year ..	..	..	..	..	..	..	1	2	3	..	1	1	..	1	..	..	1	4	5	..	..
Over 2 years ..	..	..	..	..	..	..	..	2	2	1	..	1	..	..	..	..	1	2	3	..	..
Over 3 years ..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	1	..	1	..	..
Over 4 years ..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	1	..	..
Over 5 years ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Over 6 years ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Over 7 years ..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	1	..	..
Over 8 years ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Over 9 years ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Over 10 years ..	1	..	1	..	..	..	1	..	1	..	..	..	..	..	..	..	2	..	2	..	..
Total ..	1	..	1	..	..	..	5*	7	12*	2	1	3	..	1	1	..	8*	9	17*	..	..

\*One imported case.

Table 35 shows the incidence of poliomyelitis over the past five years.

Table 35

Year	1960	1961	1962	1963	1964
Cases ..	197	57	14	68	17

*Typhoid Fever.*—The incidence has decreased considerably this year (123) from that of last year (189). There was tendency towards localisation in the Jalan Eunos area where the source of infection could not be identified but the situation improved with greater application of environmental health measures to the locality.

Table 36 gives the monthly incidence of typhoid in Singapore 1964.

Table 36

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
City ..	7	9	9	8	7	4	4	2	4	9	4	6	73
Rural ..	4	4	7	8	1	7	3	2	2	4	4	4	50
Total ..	11	13	16	16	8	11	7	4	6	13	8	10	123

*Leprosy.*—Table 37 shows the incidence of leprosy in Singapore for 1960, 1961, 1962, 1963 and 1964.

Table 37

Year	City	Rural	Total
1960 ..	119	27	146
1961 ..	62	39	101
1962 ..	69	43	112
1963 ..	75	33	108
1964 ..	89	47	136

### (3) *Health Service to the Islands*

The floating dispensaries follow a programme whereby most of the islands are visited regularly. Each launch has a Senior Hospital Assistant in charge who treats minor ailments and refers more serious cases to hospitals in the "mainland" (Singapore Island). Incidentally, he serves to discover cases of infectious diseases in islands and initiates appropriate action. A total of 6,712 cases were attended to. Of these, 3,389 were in St. John's Island where there is a resident Hospital Assistant and 3,323 were from the other islands.

### (4) *The Aedes Control and the Anti-Malarial Surveillance Unit*

The Unit is responsible for:

- the control of Aedes mosquitoes in the airport within a perimeter of 800 metres;
- malaria surveillance on an island-wide basis; and
- check on mosquito breeding areas in the Rural area.



(a) *Aedes Stegomyia Control*.—A perimeter of 800 metres round the airport is under constant vigilance and control for *Aedes aegypti* breeding. This ensures that the Airport Protection Area of a perimeter of 400 metres is completely free from larval and adult forms of all mosquitoes, with special attention paid to possible vectors of Yellow Fever.

The *Aedes* Indices achieved in 1964 are as shown in Table 38, a result of 11 surveys covering an average of 1,229 houses each quarter of the year. 48 weekly surveys were carried out to cover 130 check points in the area.

Table 38 showing the results of mosquito surveys carried out in 1964.

Table 38

Period of Survey (1964)	Number of Survey	Number of houses checked	NUMBER OF COLLECTIONS MADE				<i>Aedes</i> (S) <i>Aegypti</i> Index	<i>Aedes</i> (S) <i>Alop-</i> <i>pictus</i> Index
			<i>A</i> (S) <i>Aegypti</i>	<i>A</i> (S) <i>Albo-</i> <i>pictus</i>	<i>A</i> (A) <i>Obturatorans</i>	<i>Culex</i>		
1st Quarter . .	4	1,524	Nil	29	2	9	Nil	1.9
2nd Quarter	4	1,175	Nil	16	Nil	7	Nil	1.4
3rd Quarter	3	1,077	Nil	17	2	3	Nil	1.6
4th Quarter	4	1,140	Nil	16	2	9	Nil	1.4

(b) *Malaria Surveillance*.—177 cases were reported during the year. Of these, 62 required home investigation. 129 were definitely imported cases, and 41 were local cases (30 from the Fuyong Estate area, and 11 from Pulau Tekong). Of the remaining seven cases, two were notified with wrong addresses and could not be traced for investigation; one returned from Nepal recently and could have been infected there and another had a recent blood transfusion which could have been the source of infection; while three maintained they had never left Singapore for malarious places. Every such case was thoroughly investigated, a larval survey forming part of the investigation. Malarial vectors could not be found except on two occasions when minimal breeding of *A. maculatus* was discovered in their relative areas. History has proved unreliable in many cases, and local transmission is highly improbable when vectors cannot be detected and when the presence of parasites in the community is questionable.

(c) *Check on Mosquito Breeding Areas in Rural Areas*.—*Malaria Surveys*.—As a check on the efficiency of the Rural Anti-Malarial Work, 318 rural malarial surveys were carried out and the summary total of the various mosquito species collected on these surveys are given below:

<i>A. maculatus</i>	..	62	<i>A. baezai</i>	..	7
<i>A. sundanicus</i>	..	4	<i>A. lencosphyus</i>	..	3
<i>A. kochi</i>	..	325	<i>A. aitkeni</i>	..	2
<i>A. hyrcanus</i>	..	860	<i>A. separatus</i>	..	1
<i>A. vagus</i>	..	9			

*Special Surveys.*—18 such surveys (larval) were carried out in areas where malarial cases were reported and three surveys (adult trapping) were carried out for three nights in Fuyong Estate and for six nights at the Royal Singapore Flying Club in response to a mosquito complaint there. At Fuyong Estate, 11 culicines and two female non-infective *A. maculatus* mosquitoes were trapped, while at the Flying Club 35 culicines, 15 *mansonia* and one *Aedes* (B) *lineatopennis* were trapped.

The following were the collections made during the 18 larval surveys.

<i>A. maculatus</i>	..	19	<i>A. hyrcannus</i>	..	2
<i>A. sundaicus</i>	..	1	<i>A. aitkeni</i>	..	1
<i>A. kochi</i>	..	7	<i>A. baezai</i>	..	1
<i>A. lencosphyrus</i>	..	2	<i>A. vagus</i>	..	1

Table 39

## Work done under Airport Drainage Scheme

Widening of drains	..	1,264 ft.
Brick-wall silt traps	..	6 ft.
Brick-wall drain steppings	..	11 ft.
Brick-wall (extension to wash well)	..	1 ft.
Brick platform (Latrine base)	..	1 ft.
Standpipe base	..	1 ft.
15" Invert covered outlet drain	..	20 ft.
18" Invert covered outlet drain	..	18 ft.
15" hume pipe culvert	..	10 ft.
Maintenance (grass clearing and desilting		49,000 yds.

## 9. SCHOOL HEALTH SERVICE

### GENERAL

THE School Health Service is centrally administered in Singapore. During the year 12 new schools were opened while 9 schools ceased to function and 6 schools were integrated into 3 schools. At the end of 1964 there were 584 schools in the State of Singapore; this excludes the miscellaneous schools (e.g. religious, commercial, sewing, dancing schools, etc.). There were 59,084 new entrants, as against 58,020 in 1963. The total school population rose from 429,150 in 1963 to 457,136 in 1964, an increase of 27,986.

A classification of Government, Government Aided and private schools, together with the enrolment for 1963 and 1964 is shown in Table 40. The geographical distribution of schools, and the enrolment of Government and Aided schools as compared with private schools are given in Tables 41 and 42.

Table 40

#### SUMMARY OF SCHOOLS AND SCHOOL POPULATION

		Number of Schools		Enrolment	
		1963	1964	1963	1964
<i>Government Schools</i>					
(a) English	..	136	128	157,968	154,870
(b) Malay	..	47	43	28,225	25,352
(c) Chinese	..	13	13	16,195	17,003
(d) Indian	..	2	2	172	195
(e) Integrated	..	27	43	28,624	63,653
<i>Aided Schools</i>					
(a) English	..	47	49	44,927	46,474
(b) Chinese	..	224	221	138,326	135,807
(c) Indian	..	13	13	1,494	1,587
<i>Private Schools</i>					
(a) English	..	40	42	8,896	8,327
(b) Chinese	..	33	30	4,323	3,868
Total	..	<u>582</u>	<u>584</u>	<u>429,150</u>	<u>457,136</u>

57.11% of all the pupils attended Government Schools.

40.22% of all the pupils attended Aided Schools.

2.67% of all the pupils attended Unaided Schools.

Table 41

#### GEOGRAPHICAL DISTRIBUTION OF SCHOOLS

	City	Rural	Island	Total
Government and Government Aided Schools ..	269	223	20	512
Private Schools ..	57	14	1	72



Table 42

## DISTRIBUTION OF SCHOOL POPULATION

Government and Government Aided Schools	..	444,941
Private Schools	..	12,195
Total	..	<u>457,136</u>

## STAFF

At the end of 1964 the staff of the School Health Section consisted of one Senior Health Officer in charge of Schools, six Health Officers, six Lady Health Officers, three Health Sisters, 15 Staff Nurses, 2 Male Nurses, 16 Assistant and Assistant Health Nurses, 1 Almoner, 1 Chief Dispensing Assistant, 3 Dispensing Assistants, 1 Laboratory Technician, 2 Public Health Inspectors, 1 Radiographer, 24 clerks and other miscellaneous subordinate staff.

Table 43

## SUMMARY OF SCHOOLS, SCHOOL POPULATION, CHILDREN EXAMINED, AND HEALTH OFFICERS 1960-1964

		1960	1961	1962	1963	1964
Registered Schools	..	762	776	568*	582*	584*
Students	..	353,408	379,604	401,587	429,150	457,136
Students Examined	..	109,214	93,402	132,392	115,843	125,289
Health Officers	..	12	11	11	12	12

\* A School with morning and afternoon sessions is counted as one school.

## ROUTINE MEDICAL EXAMINATIONS

Medical examinations of children were carried out by the School Health Officers in Government and Government Aided schools only. Whilst no examinations are conducted at non-aided (private) schools, children from such schools may, and do, attend the school clinics which are open to all school children.

Because of the enormous size of the school population it has been found necessary to establish a system of selective examinations. The School Health Officers during their visits to schools for the routine medical examinations confine their attention to particular groups. The groups include (a) new entrants, (b) primary and secondary school leavers, (c) defectives found at previous examinations. During the visit to the school, the staff are encouraged to refer children who were not due for routine periodic examination but whose physical or mental progress was considered to be below par. These children are listed as "Others". These four groups are referred to in the report as "New Entrants", "School Leavers", "Re-examinations" and "Others".

As it is quite impossible to obtain an accurate history of past illnesses, previous inoculations, etc. from children aged 6-7 years in the Primary I classes, the parents of these children are invited to be present during the routine examinations. Their presence also affords an excellent opportunity for the Health Officers to advise them on hygiene and diet.

Out of a total of 512 Government and Government Aided schools, 495 were visited by either a Health Officer or a Lady Health Officer, and in the case of a mixed school by both a Health Officer or a Lady Health Officer. The total number of children examined was 125,289 so that more than one fourth of the school population was examined by the School Health Officers.

Table 44 shows the number of boys and girls examined at the various types of schools.

Table 44

## CLASSIFICATION OF CHILDREN EXAMINED

		Girls	Boys	Total
Government English	..	26,082	25,246	51,328
Aided English	..	7,656	6,531	14,187
Government Chinese	..	1,776	1,449	3,225
Aided Chinese	..	14,930	17,709	32,639
Government Malay	..	3,446	3,022	6,468
Government Tamil	..	65	35	100
Aided Tamil	..	229	151	380
Government Integrated	..	7,870	9,092	16,962
Total	..	<u>62,054</u>	<u>63,235</u>	<u>125,289</u>

It was considered particularly important to examine the new entrants, in order to diagnose and treat defectives as early as possible, and where time was limited, the Health Officers concentrated on this group. According to the Ministry of Education statistics 59,084 children entered school for the first time in 1964, of these 50,936 were examined during the year by the School Health Officers. Table 45 shows the total number of school children in the various groups that were examined by the Health Officers.

Table 45

## CLASSIFICATION OF EXAMINATIONS DONE

		Girls	Boys	Total
New Entrants	..	22,923	28,013	50,936
Primary Leavers	..	16,997	23,923	40,920
Secondary Leavers	..	4,508	5,448	9,956
Re-Examinations	..	12,107	4,168	16,275
Others	..	5,519	1,683	7,202
Total	..	<u>62,054</u>	<u>63,235</u>	<u>125,289</u>

Table 46 shows the classification of the various types of schools visited by the Health Officers for the purpose of conducting medical examination of school children.



Table 46

CLASSIFICATION OF SINGAPORE SCHOOLS INSPECTED BY  
SCHOOL HEALTH OFFICERS

		City	Rural	Island	Total
Government English	..	83	40	2	125
Aided English	..	26	22	—	48
Government Chinese	..	10	3	—	13
Aided Chinese	..	85	126	4	215
Government Malay	..	14	14	12	40
Government Tamil	..	2	—	—	2
Aided Tamil	..	8	4	—	12
Government Integrated	..	25	14	1	40
Total	..	<u>253</u>	<u>223</u>	<u>19</u>	<u>495</u>

## GENERAL HEALTH

On the whole, the general standard of health of the new entrants is fair, and that of the school leavers good. Of the total number of school children examined by the School Health Officers, 38,839 or 61.42 per cent of the boys examined were rated as being of good general condition, 23,740 or 37.54 per cent fair, and 656 or 1.04 per cent poor. The corresponding figures for girls are, 26,951 or 43.43 per cent good, 31,076 or 50.08 per cent fair, and 4,027 or 6.49 per cent poor.

Apart from dental caries and defective vision, a much higher percentage of defectives was found among the new entrants. The main defects amongst the school children are skin and respiratory infections, poor dental and personal hygiene and ignorance of parents of their children's dietetic requirements.

*Dental Caries.*—This is by far the most common defects amongst the school children. The majority cannot afford dental treatment, especially those from the rural areas. The present facilities for dental treatment are still inadequate. There are two main Government Dental Clinics for the treatment of school children, one at the Institute of Health and the other at Pegu Road, near Tan Tock Seng Hospital. In addition there are 3 school mobile dental clinics and 24 school dental huts. The Dental Nursing School is producing about 20 Dental Nurses a year and these will help staff new school dental clinics.

It is distressing to note that some parents of school children in schools where there are dental huts, are refusing to have their children treated. They fail to realise that any minor discomfort experienced by their children is well compensated for by the great improvement in dental health obtained. The fluoridation of the Singapore water supply is now reflected in the gradually lessening incidence of dental caries, although this still remains the most common defect found among school children.



*Skin Infections.*—Skin conditions such as sores, ulcers, ringworm, eczema and scabies are found to be slightly more common among school children in the rural schools due to the lower standard of environmental hygiene. Malnutrition also accounts for dry scaly skin, phrynodema, angular stomatitis, etc.

Many of these skin complaints affect usually all the members of a family simultaneously and consequently the eradication of such conditions from the school population is more difficult since the school children alone will receive treatment. It is therefore obvious that not only the children involved, but the whole family should be treated and given all the advice and guidance.

Five cases of suspected Hensen's disease were referred to the Irrawady Road Skin Clinic and of these three were proved cases of Leprosy.

*Ear, Nose and Throat.*—Twelve cases of deafness were reported. Infections of the middle ear, which were usually chronic, were referred to the E.N.T. Specialist for treatment. A number of children were found to have enlarged tonsils and parents were instructed with regard to conservative treatment. Tonsillectomy was not recommended except in cases with a history of repeated sorethroats or where the general condition of the child was below normal.

*Organic and Valvular Heart Disease.*—Mitral stenosis, auricular and ventricular septal defects, and patent ductus arteriosus are the common heart defects found. In the case of the acquired cardiac disabilities, they are probably of rheumatic origin although a previous history of rheumatic fever is very difficult to obtain.

*Respiratory Infections.*—Children from the urban areas, where overcrowded living conditions and poor ventilation are more common, were more susceptible to infection of the upper respiratory tract.

Bronchial asthma is quite a common condition found among the school children. Children with poor physical development associated with a history of chronic cough are mantoux-tested and sent for radiological examination of the chest. Suspected cases of Primary Complex are referred to the School Tuberculosis Officer for diagnosis and treatment.

*Genito-Urinary.*—Phimosis, inguinal hernia and hydrocele were the common defects found among the boys. With the consent of the parents, these children were referred to the consultants and surgeons of the General Hospital for further treatment.

*Blood Conditions.*—Cases of anæmia, particularly gross anæmia, were found more in the rural areas, where worm infestation is prevalent. A certain number of these cases were due to nutritional causes in both urban and rural areas.

*Worm Infestation.*—The incidence is higher amongst the children in the rural areas as compared with the urban school children. This is due to inadequate sanitation, the illegal use of nightsoil as a vegetable manure and the failure of the rural children to use protective footwear.

Table 47

INCIDENCE OF DEFECTS DETECTED IN ROUTINE SCHOOL EXAMINATIONS  
(Figures for incidence of defects expressed as percentages)

			1960	1961	1962	1963	1964
Dental Caries	..	.. Boys Girls	55.64 39.85	47.38 44.41	47.24 41.11	40.59 38.68	35.85 40.01
Skin Infection	..	.. Boys Girls	6.01 8.56	3.33 9.97	4.36 9.15	3.70 6.94	4.11 5.35
Eyes: Infection	..	Boys Girls	.87 .77	.49 .51	.73 .39	.91 .35	1.51 .34
Defective vision	..	Boys Girls	4.87 6.34	5.52 7.33	6.52 7.68	5.72 10.17	6.33 9.02
E.N.T. Enlarged tonsils	..	Boys Girls	1.17 .29	.43 .07	.15 .11	.52 .22	.16 .19
Ear infections	..	Boys Girls	.47 .16	.28 .14	.34 .06	.39 .07	.47 .06
Cardiac Disease	..	Boys Girls	.53 .64	.24 .44	.27 .39	.65 .52	.77 .44
Respiratory Infection	..	Boys Girls	1.08 3.12	.75 2.20	.96 1.00	1.53 1.14	1.31 2.04
Genito-Urinary	..	Boys Girls	2.86 .34	2.05 .38	2.86 .27	6.10 .24	6.17 .29
Anaemia (under 60% Hb.)	..	Boys Girls	.55 .90	.55 .51	.33 .58	.46 1.28	.12 .96
Worm Infestation	..	Boys Girls	2.52 8.83	3.46 8.70	1.34 5.06	.76 4.58	4.16 5.47
Other abnormalities including post- ural defects, Cleft Palate, Chest deformities	..	Boys Girls	.82 3.18	.42 2.79	1.36 1.02	2.27 1.54	2.49 2.00
Children Examined	..	Boys Girls	50,624 58,590	44,695 48,707	61,489 70,903	63,402 52,441	63,235 62,054

*Personal Hygiene.*—There has been some improvement in general cleanliness among school children. School Health Officers have been able to get the co-operation of teachers in most cases to improve the hygiene habits of the children. More attention, however, should still be paid to the care of teeth and finger nails, and the wearing of shoes in rural schools. Pediculosis is prevalent among Malay Schools and to some extent in Tamil Schools. The school teachers can play an important part in its eradication.

*School Clinics.*—There is one main clinic at the Institute of Health, Outram Road, which functions daily both in the mornings and afternoons. The Health Officers have regular morning and afternoon sessions in order



to follow up their own cases and to see outpatients of school children. There are three subsidiary clinics in the suburban and rural areas. The Paya Lebar Clinic functions on Monday and Friday afternoons, the Kallang Clinic on Wednesday afternoons and the Bukit Timah Clinic on Saturday mornings. The Health Officers responsible for the schools served by the particular clinic are in attendance at each clinic session.

Table 48

ATTENDANCES AT SCHOOL CLINICS						
		1960	1961	1962	1963	1964
Total number of new cases	..	55,056	52,196	55,678	53,160	54,973
Total number of re-visits	..	81,057	74,612	92,664	91,948	93,820
		<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Total	..	136,113	126,808	148,342	145,108	148,793

Table 49

BREAKDOWN OF SCHOOL CLINIC ATTENDANCES, 1964

		New Cases	Repeat Cases	Total
Institute of Health Clinic	..	46,010	84,085	130,095
Paya Lebar Clinic	..	5,111	3,747	8,858
Kallang Clinic	..	2,306	3,728	6,034
Bukit Timah Clinic	..	1,546	2,260	3,806
Total	..	<u>54,973</u>	<u>93,820</u>	<u>148,793</u>

*Laboratory Investigations.*—Routine Laboratory examinations are conducted in the main clinic at the Institute of Health where there is a small Laboratory staffed by a qualified Laboratory technician. 6,593 investigations were carried out by him as against 6,693 in 1963.

*School Travelling Dispensaries.*—Two travelling dispensaries in charge of one Health Sister, assisted by 4 nurses visited the rural schools during the year for the treatment of minor ailments and to follow up cases referred by the School Health Officers.

Table 50

TOTAL NUMBER OF VISITS TO SCHOOLS BY THE SCHOOL TRAVELLING DISPENSARIES AND THE TREATMENT GIVEN

		1962	1963	1964
Total Number of visits to schools	..	935	828	932
Total Number of treatment given	..	47,345	41,535	47,292



Table 51

## CASES REFERRED TO SPECIALISTS, HOSPITALS AND OTHER INSTITUTIONS, 1964

(a) Cases referred to Specialists:		(b) Cases referred to Hospitals and other Institutions:	
Cardiac Specialist	.. 147	Casualty Department General Hospital	689
E.N.T. Specialist	.. 300	Emergency Unit, General Hospital ..	450
Psychologist	.. 18	Outpatient Department, General Hospital	18
Psychiatrist	.. 23	General Hospital for admission ..	208
Paediatrician	.. 193	Physiotherapy Dept., General Hospital	7
Ophthalmic Surgeon	.. 543	Middleton Hospital ..	66
Surgeons	.. 1,019	Social Hygiene Clinic, Middle Road ..	3
Physicians	.. 116	Trafalgar Home ..	2
Orthopaedic Surgeon	.. 147	Cases sent to School Tuberculosis Officer	35
Skin Specialist	.. 60	Dental Clinic at Institute of Health ..	537
Gynaecologist	.. 16	Dental Clinic at Pegu Road ..	16
		Dental Clinic at Jalan Teck Whye ..	35
		X-ray Dept. at General Hospital ..	73
		X-ray Dept. at Institute of Health ..	689
Total	.. 2,581	Total	.. 2,828

*Cases referred from School Clinics.*—2,581 cases were referred to specialists and 2,828 cases were referred to various institutions.

Table 52

## INFECTIOUS DISEASES IN SCHOOLS

	1960	1961	1962	1963	1964
Chickenpox	244	170	158	285	104
Diphtheria	425	335	162	111	52
Mumps	984	447	300	514	776
Dysentery	26	26	24	11	14
Leprosy	6	3	1	2	3
Malaria	1	2	6	3	2
Measles	20	17	28	118	88
Poliomyelitis	2	3	1	1	2
Typhoid fever	6	7	—	2	—
Whooping cough	83	35	25	10	28
Cholera	—	—	—	—	3

*Cholera Cases.*—There were 3 cases among school children reported in 1964.

## HOME AND SCHOOL VISITING

Homes and Schools were visited by the Health Nurses of the Travelling Dispensaries and the Institute of Health Clinic:—

- (i) to investigate and follow up cases of tuberculosis before transfer to the School Tuberculosis Officer;
- (ii) to investigate cases of infectious diseases reported by School Principals or the Senior Health Officer i/c Epidemiology;

- (iii) to take throat swabs of all indirect class contacts of diphtheria. 521 throat swabs were taken in 1964 as against 1,164 in 1963;
- (iv) to call up patients who have failed to see the doctor as arranged e.g. cases of suspected leprosy;
- (v) to vaccinate new entrants (56,257 new entrants were vaccinated in 1964 as against 59,114 in 1963).

*Diphtheria, Tetanus and Poliomyelitis Immunisations.*—From May this year diphtheria and tetanus immunizations were started among Primary one school children. At the same time oral poliomyelitis immunisation was given to these children. Two immunisation teams started in May, while a third team was added in June. The following Table 53 summaries the work done by the School Immunisation teams:—

Table 53

Number of schools visited (1st visit)	...	257
Number of schools visited (2nd visit)	...	253
Number of children immunised (1st and 2nd visits)	...	63,698
Diphtheria — Tetanus 1st dose	...	25,184
2nd dose	...	21,975
Booster	...	4,298
Tetanus toxoid	...	2,309
Sabin 1st dose	...	33,640
2nd dose	...	29,471

*School Milk Scheme.*—Skimmed milk for undernourished school children was supplied as in the past, by the Social Welfare Department on the recommendation of School Health Officers. 28,786 children were recommended for skimmed milk in 1964 as against 32,633 in 1963. More and more principals are showing an interest in this scheme. In order to prevent any wastage, the Social Welfare Department distributed this milk only to the principals who were sufficiently interested to see that the children were given the milk daily.

*Almoner Service.*—The Almoner in the School Health Section deals with the medico-social problems of the school children. 456 new cases were seen in 1964 of which 323 were undernourished children. Children were supplied with free supplementary rations if their parents cannot afford them, while others are given dietary advice. 50 children were recommended for admission to the Singapore Children's Society Convalescent Home.

Educationally backward children are referred to the Almoner. 25 children were referred for I.Q. tests. A total of 1,265 pairs of spectacles were supplied in 1964.



## ENVIRONMENTAL HYGIENE IN SCHOOLS

Further improvement in the field of environmental hygiene and sanitation of schools was made during 1964.

New schools were erected with due consideration to health and hygiene and old buildings were renovated or reconstructed and in some cases extensions made to improve the existing sanitary condition of the schools.

Two fully qualified Public Health Inspectors are engaged on a whole time basis for duties connected with the School Health Service. Visits are made regularly to schools for the purpose of routine inspections or in connection with special investigations. Routine inspections are confined to yearly inspection of the existing schools for the purpose of ascertaining whether the provisions of the Education Ordinance and the Regulations made thereunder are being complied with. The special visits are made because of complaints received, nuisances reported, applications by new schools for registration, new school projects and any additions or alterations to existing schools. In 1964 896 inspections were made.

A total of 104 building plans were submitted for advice and recommendations. All of them were recommended for approval subject to compliance of the health requirements.

The Senior Health Officer i/c Schools was asked by the Ministry of Education to inspect 8 schools prior to their registration. All these applications were recommended for registration from the health point of view subject to compliance of health requirements.

As reported in previous years, overcrowding still existed in a few vernacular schools. The Ministry of Education after consultation with the Ministry of Health, granted as a temporary measure, a 10 per cent overcrowding allowance to all standard size classrooms, and thereby permitting a maximum of 44 pupils per classroom as against the 40 allowed for in the school Regulations.

Regular inspections were made of school canteens to ensure a high standard of food hygiene. Health education and advice were freely given to stall-holders as well as the staff of schools during such visits. In 1964 ten schools were provided with proper tuckshops while 6 more schools were recommended to have them installed. Five schools were installed with modern sanitation while 9 schools were recommended to install the water-carriage system.



## 10. MATERNAL AND CHILD HEALTH SERVICES

### GENERAL

WITH integration, the Maternal and Child Health Services in the City as well as the Rural areas have been unified since 1960 and are now centrally administered.

The year 1964 has been of consolidation for the Maternal and Child Health Services. As there is only one new clinic opened during the year, there has been time to take stock of the organisation and staffing and try wherever possible to streamline the work and standardise procedures for both City and Rural clinics following full integration.

Normal duties were interrupted on several occasions throughout the year due to two riots and civil disturbances and civil disasters such as fires and floods, while three cholera campaigns affected the usual services offered.

The service operates a net work of 3 types of clinics which are distributed as follows:

		Rural	City	Total
(a) Main Centres	...	24	10	34
(b) Kampong Midwives Centres*		5	—	5
(c) Visiting Centres	...	24	1	25

\* Excluding 3 others from last year which have now been combined as visiting centres.

The main function of the service is preventive although limited curative work has to be included so as to meet the exigencies of the health needs of the population. The Maternal and Child Health Doctors also assist in training programmes, including lectures to Midwives, Health Visitors and Public Health Inspectors-in-Training.

#### LIST OF CLINICS AND CENTRES AS ON 31ST DECEMBER, 1964

Main Clinics (34)	Midwife Centres	Visiting Centres (23)
Rural	(Residential)	Rural
Airport	*Bulim, 13¼ m.s.	Tg. Murai
Ama Keng	Jurong, 10 m.s.	Kg. Blukang
Bedok, 9 m.s.	*Kg. Loyang	Kg. Bajau
Bukit Panjang	*Ponggol, 9¼ m.s.	Damar Laut
Bukit Timah	Somapah	Pulau Sudong
Buona Vista	St. John's Island	Pulau Semakau
Chai Chee	P. Ubin	Pulau Seking
Changi	*Midwife Centre cum	Pulau Seraya
Holland Road	visiting centre	Pulau Bukom Kechil
Jalan Bahru		Lazarus Island
Jurong, 12 m.s.		Pulau Ayer Melinan
Jurong, 18 m.s.		Pulau Ayer Mertau
Kampong Batok		P. Semulor
Kim Chuan Road		P. Sebarok
Kranji		Ayer Gemuroh
Lim Ah Pin		Chia Keng Village
Mandai		Pulau Ubin
Pulau Brani		Ponggol
Pulau Tekong		Kg. Loyang

LIST OF CLINICS AND CENTRES AS ON 31ST DECEMBER, 1964 — *contd.*

Main Clinics (34)	Midwife Centres	Visiting Centres (23)
Rural	(Residential)	Rural
Sembawang		Bulim
Still Road		Loyang
Thomson Road		St. John's Island
Thong Ho		
Yio Chu Kang		City
		Radin Mas
City		
Alexandra		
Aljunied Road		
Bukit Ho Swee		
Institute of Health		
Joo Chiat		
Kallang Estate		
Kim Keat Road		
Kreta Ayer		
Prinsep Street		
Queenstown		

\* (1) Princess Elizabeth Estate sessions stopped with effect from 15th February, 1960.

(2) Woodlands, 15½ m.s. sessions stopped with effect from October 1962.

The Maternal and Child Health Clinics also serve the needs of the child and mother population of the islands off Singapore. This service is performed by a health team usually comprising a Health Officer, Health Nurse, an Assistant Nurse, a Midwife and a Hospital Assistant. The team travels by motor launch and the islands are visited at least weekly or bi-weekly. However, owing to staff shortage in 1964, a Staff Nurse was put in charge and has managed to carry on by bringing the problems to the Senior Health Officer and Public Health Matron whenever these arise for advice.

To help matters, especially in the case of emergencies, the Floating Dispensary *Seraya* has been equipped with radio-telephone from May 1964. The staff carried on despite rough seas and bad weather which often forced the team to deviate from their scheduled visits to certain islands.

## MATERNITY SERVICES

These include (a) antenatal care, (b) natal care, (c) post-natal care. In addition, the Family Planning Association holds regular sessions at the main Maternal and Child Health Clinics.

(a) *Antenatal care*.—In spite of the disturbances to normal routine caused by two periods of civil disturbances in 1964 and the heavy rains in the latter two months of the year, antenatal attendances rose by 20,846 visits over the previous year. A comparative table of antenatal visits to Rural and City Maternal and Child Health Clinics for the last five years is shown below:

Table 54

## ANTENATAL VISITS TO M. &amp; C.H. CLINICS

Year		Rural	City	Total
1960	...	105,907	27,760	133,567
1961	...	108,067	31,946	140,013
1962	...	111,995	39,313	151,308
1963	...	80,458	40,169	120,627
1964	...	89,378	52,095	141,473



In the last quarter of the year attendances at antenatal clinic sessions were increased, especially in City clinics. This was due to re-organisation of the Maternity Services at Kandang Kerbau Hospital whereby all normal antenatal cases have been referred to Maternal and Child Health sessions in the first instance. An appointment system for referral of cases needing specialised curative care was instituted since Kandang Kerbau Hospital have limited their intake to more manageable proportions. A good deal of adjustment of duties had to be made to cope with the increases, and plans were in hand in case there were further increases.

(b) *Natal care*.—This is provided for in the Domiciliary Midwifery Service. Midwives employed by the Government are responsible at the main clinics and at the Midwife Centres. There is a 24-hour service available for patients who have been attending the clinic and who are found to be suitable for domiciliary delivery.

The universal trend, however, is growing towards institutional confinement, which is desirable and in the best interest of mother and child. More and more mothers are going to Kandang Kerbau Hospital for their confinements—more than 60 per cent of births occur in Kandang Kerbau Hospital alone. The following table shows deliveries in the Kandang Kerbau Hospital and those cases attended by Government Midwives and Private Midwives for the last three years.

		Number of Confinements in the Home Attended by Health Midwives			Confinements in Kandang Kerbau Hospital		
		Rural Area	City Area	Total	Private Midwives	Total Births*	
1962	...	5,045	880	5,925	10,572	37,861	59,717
1963	...	4,526	887	5,413	8,176	39,436	60,269
1964	...	5,320	1,016	6,336	8,006	39,598	58,911

\* Total Live and Still Births as given in Annual Report of Registrar General of Births and Deaths.

With the imposition of a \$10 charge for confinements in Kandang Kerbau Hospital, it was expected that there would be an increased demand for confinements in the home, but except for a very short time initially, Midwives' case load of 3-5 cases per Midwife per month still continues.

There were 16 maternal deaths in cases undertaken by the service, as compared to 10 last year. Of these 16 deaths, 12 were Malays, 1 Chinese and 3 were Indians. 13 deaths occurred in the home and 3 in hospital. In the majority of these 16 maternal deaths, the histories showed that 75 per cent could have been avoidable had patients listened to advice regarding hospital confinement and proper attendance in the confinement.

(c) *Post-natal care*.—This is achieved by:

(i) The Domiciliary After-care Service,



(ii) Follow-up of new delivery by District Sister.

(iii) Post-natal visits to the clinics.

(i) *The Domiciliary After-care Service*.—This service caters for mothers who are delivered at Kandang Kerbau Hospital and the return home within 24 hours. This includes both City and Rural areas and the following table shows the number of patients attended by the D.A.C. for the last 3 years:

#### NUMBER OF D.A.C. PATIENTS

Year		Rural	City	Total
1962	...	10,180	11,920	22,100
1963	...	11,245	12,279	23,524
1964	...	11,949	12,165	24,114

(ii) *Follow-up of new delivery by District Sister*.—Every registered new birth is visited by the District Health Sister. This includes mothers and infants who are delivered by private midwives. All ill cases in the puerperium are referred to the Health Officer in charge of the district who will then attend to them, if the private practitioner is not in attendance.

Midwives practising in Singapore are under the supervision of two Supervisors of Midwives—a Rural Supervisor and a City Supervisor. The Rural Supervisor is responsible for all Government Midwives in the Rural area and Pupil Midwives undergoing their domiciliary training, while the City Supervisor supervises the City Midwives and the Midwives in private practice. This supervision excludes trained Nurse Midwives.

Below are tables which are summaries of the work done in relation to Maternal Services for 1962, 1963 and 1964:

#### SUMMARIES OF WORK DONE IN RELATION TO MATERNAL SERVICES IN 1962—1964

	1962			1963*			1964		
	Rural	City	Total	Rural	City	Total	Rural	City	Total
Antenatal Visits to Clinics .. ..	111,995	39,313	151,308	80,458	40,169	120,627	89,378	52,095	141,473
Postnatal Visits to Clinics .. ..	3,922	339	4,261	3,414	983	4,397	3,979	3,979	7,958
Confinements attended by Government Midwives .. ..	5,045	880	5,925	4,526*	887	5,413	5,320	1,016	6,336
Mother in Labour sent to K.K.M.H.* ..	847	26	873	465	25	490	570	22	529
Visits by Midwives in Puerperium† ..	90,251	57,621	147,872	92,249	62,934	155,183	97,349	60,660	158,009

\*Kandang Kerbau Hospital.

†These include visits for cases in both the Domiciliary Service and the Domiciliary After-Care Services.

		1962	1963	1964
		Total	Total	Total
Total No. of Live Births	...	58,977	59,530	58,217
Total No. of Still Births	...	740	739	694
Confinements attended by Government Midwives	...	5,925	5,413	6,336
Confinements attended by Private Midwives Class B+	...	10,572	8,176	8,006
Confinements attended by Private Doctors	...	2,924	3,395	3,632
Confinements in K.K.M.H.	...	37,861	39,436*	39,598
Self-attended cases	...	22	38	82

\* 1963 — figure confirmed with M.S., K.K. Hospital.

### THE CHILD HEALTH SERVICES

The services provided for the pre-school child are:

- (a) A comprehensive immunization programme.
- (b) Advice and Health Education to mothers on child care, in particular the infant.
- (c) Treatment of minor ailments.

(a) *The Immunization Programme.*—This includes (i) B.C.G. vaccination, (ii) vaccination against smallpox, (iii) immunization against diphtheria, whooping cough and tetanus, (iv) immunization against poliomyelitis, (v) cholera immunization (emergency campaigns).

(i) *B.C.G. Vaccination.*—B.C.G. vaccination continued to be well accepted by the public as shown by the following figures:

#### B.C.G. VACCINATION IN MATERNAL AND CHILD HEALTH CLINICS

1962	...	12,186
1963	...	14,025
1964	...	14,663

Nearly 100 per cent of Government midwife cases are referred for B.C.G. but cases delivered by private midwives are not all being referred for B.C.G. although Supervisors of Midwives have advised them to do so.

(ii) *Smallpox Vaccination.*—Smallpox vaccination is compulsory by law and all children must be vaccinated by the age of six months. A total of 45,774 children were given primary vaccinations through the Maternal and Child Health Services and a further 9,985 were given vaccinations by private doctors, making a total of 55,759, representing 95 per cent of the total births for 1964.

(iii) *Diphtheria Immunization.*—This is given either alone or in combination with other immunizing agents, thereby giving protection against diphtheria, whooping cough and tetanus. Although diphtheria immunization has been made compulsory since April 1962, the response to immunization



by one year of age is not complete. However, there are a large number who do come up between one to two years, when they feel the child is older and more able to withstand any reactions which may arise. Immunization is carried out in all Maternal and Child Health Clinics. A total of 40,103 children completed their primary immunization with Triple Antigen. This figure constitutes 96.8 per cent of 41,394 children, who originally had their first dose.

(iv) *Poliomyelitis Immunization*.—Poliomyelitis has been a regular feature in the immunization programme since March 1963 when oral Sabin vaccine was used. This policy was continued from 1962 when Sabin vaccine was first widely used in a campaign which averted an expected epidemic.

In 1963 there were 68 cases of notified poliomyelitis. During 1964 there were only 18 cases — one being an imported case from Johore.

After due consultation with the Professor of Bacteriology, all infants and pre-school children besides receiving their primary course of oral Sabin are receiving a fourth dose when they return for their booster doses for anti-diphtheria with effect from 1st October, 1964.

(v) *Cholera Immunization*.—For the second year running the Maternal and Child Health Services were mobilised to administer cholera immunization to the public. Two emergency immunization centres for cholera were opened at the end of January 1964 at Buona Vista and Bukit Panjang Maternal and Child Health Centres. These centres were subsequently closed down on 5th March, 1964. Because of the recent mass campaign against cholera, the response was poor with only 546 persons coming in for immunization. From 5th April to 28th July a total of 25,796 persons were immunized at 10 Maternal and Child Health Centres.

As a result of a sporadic case of cholera which occurred in August 1964, 194 persons were immunized against cholera.

(b) *Advice and Health Education on Child Care*.—There was a fall in attendances at infant and pre-school sessions due probably to the disruption of service from cholera campaigns and the two periods of civil disturbances in July and September when curfew was imposed for the whole State for several days. In December, due to bad weather and heavy rains, mothers and children kept away.

In 1964, 443,273 infants and 366,345 pre-school children attended the clinics.

Advice given revolves mainly around the infant. If necessary, milk powder, multivitamins, protein foods and other additional nutrients are given to families.

(c) *Treatment of minor ailments*.—Treatment of a certain amount of minor ailments is part of the functions of the Maternal and Child Health Clinics, although this is often done at the expense of preventive work,



## ATTENDANCES—THE NUMBER OF CHILDREN IMMUNISED AND OTHER FUNCTIONS CARRIED OUT AT THE MATERNAL AND CHILD HEALTH CLINICS—1962, 1963 AND 1964

	1962			1963			1964		
	Rural	City	Total	Rural	City	Total	Rural	City	Total
<i>Attendances</i>									
Infant ..	176,488	250,749	427,237	177,685	269,854	447,539	182,572	260,701	443,273
Pre-school ..	333,077	400,139	733,216	199,105	183,826	382,931	187,518	178,827	366,345
B.C.G. ..	5,602	6,584	12,186	6,520	7,505	14,025	6,956	7,707	14,663
Primary Vaccination ..	20,554	26,621	47,175	19,243	26,237	45,480	19,528	26,246	45,774
<i>Diphtheria Immunisation</i>									
Clinic: T.A.									
1st Dose ..	23,650	40,045	63,695	20,684	28,850	49,534	18,913	21,561	40,474
2nd Dose ..	20,003	31,549	51,552	17,129	27,070	44,199	17,489	22,760	40,249
3rd Dose ..	17,387	27,622	45,009	17,345	26,027	43,372	16,523	22,983	39,506
Boosters ..	12,875	7,695	20,570	11,281	4,947	16,228	8,311	2,833	11,144
Kampong:									
1st Dose ..	717	..	717	722	1,914	2,636	685	235	920
2nd Dose ..	302	..	302	434	851	1,285	486	213	699
3rd Dose ..	202	..	202	353	53	406	445	152	597
Boosters ..	715	..	715	605	522	1,127	565	58	623
<i>Diphtheria Immunisation</i>									
Clinic:									
1st Dose ..	3,497	13,123	16,620	2,212	4,444	6,656	2,863	6,699	9,562
2nd Dose ..	2,664	10,579	13,243	1,939	4,530	6,469	2,276	5,631	7,907
Boosters ..	2,909	4,800	7,709	4,242	2,121	6,363	8,861	4,418	13,279

ATTENDANCES—THE NUMBER OF CHILDREN IMMUNISED AND OTHER FUNCTIONS CARRIED OUT AT THE MATERNAL AND CHILD HEALTH CLINICS—1962, 1963 AND 1964—*contd.*

	1962			1963			1964		
	Rural	City	Total	Rural	City	Total	Rural	City	Total
Kampong:									
1st Dose	383	..	383	288	1,253	1,541	362	1,530	1,892
2nd Dose	140	..	140	143	912	1,055	185	1,140	1,325
Boosters	231	..	231	245	495	740	326	730	1,056
Polio myelitis Immunisation									
	1962 Campaign								
	5123 × 2 (Rural + City)								
1st Dose	..	..	228,040	23,204	30,885	54,089	24,426	29,201	53,627
2nd Dose	..	..	207,007	18,195	22,131	40,326	23,119	28,768	51,887
3rd Dose	..	..	..	15,048	17,006	32,054	23,932	27,212	51,144
1962—S. 3	..	..	..	19,371	8,594	27,965	12,428	6,979	19,407
Boosters S. 4	..	..	..	..	..	..	7,546	1,295	8,841
Free Milk Distribution									
1. Milk to A/N Mothers	2,242	1,217	3,459	3,374	1,213	4,587	2,369	2,792	5,161
2. Milk to Children	2,947	11,506	14,453	40,347	52,308	92,655	33,597	43,503	77,100
3. Total Amount of Powdered Milk in lb.	36,194	60,097	96,291	43,721	53,526	97,247	35,966	46,295	82,261
Skimmed Milk									
Mothers	8,191	5,029	13,220	8,561	8,303	16,864	18,478	6,609	25,087
Children	495	171	666	2,358	367	2,725	3,775	165	3,940
Total No. of lb.	21,972	7,976	29,948	10,919	8,670	19,589	22,253	6,774	29,027



## 11. TRAINING AND HEALTH EDUCATION

### INTRODUCTION

THIS Branch created in November 1963 is now under the charge of a Senior Health Officer. It consists of three Units: (1) Training Unit; (2) Health Education Unit; (3) Special Assignments Unit. During the year under review, programmes were planned to involve all the three Units. This has been desirable from the functional point of view, as many of the programmes planned are inter-related. The main activities for the year under review are as follows:

#### THE TRAINING UNIT

The Training Unit is responsible for (a) the training of Public Health Inspectors; (b) the training of Public Health Nurses; (c) in-service training courses for: (i) Technical Subordinates, (ii) Public Health Inspectors-in-Training, (iii) other health auxiliaries.

It also liaises with other training institutions and the staff are involved in assisting with the teaching in relation to Public Health carried on in these institutions. This Unit also organizes seminars and symposiums.

(a) *The Training of Public Health Inspectors.*—Training of Public Health Inspectors is carried out at the Institute of Health and is one of the oldest courses of training in Singapore. The Overseers Examination Board which was originally established in 1921 is responsible for preparing the scheme of training and holding of examinations for Public Health Inspectors in this region — Singapore, Federation of Malaya, Sarawak, North Borneo and Brunei. The Board has functioned continuously since its inception except for the interruption due to the World War II of 1942–1946, and for a brief period between 1951–1952, when staff shortages made it impossible to run the course.

In January 1959, a Public Health Inspectors' Training School was started in Kuala Lumpur on the same lines as the training centre in Singapore, and since then courses and examinations for Public Health Inspectors are held simultaneously in Singapore and Kuala Lumpur.

The 10-month course leads to the Diploma of the Royal Society of Health.

*The Public Health Inspectors' Training Course, 1964.*—This was the 34th session of the Royal Society of Health in the training of Public Health Inspectors in Singapore. It commenced on 13th January, 1964 and ended on 21st November, 1964. There were 11 candidates, 7 from Sabah, including for the first time in its history a woman. The examination was conducted from 9th November, 1964 to 18th November, 1964. The results are awaited, pending ratification by the Council of the Royal Society of Health in London.



(b) *The Training of Public Health Nurses.*—In 1955, the first Health Visitors' Course held in Malaya was conducted in Penang. The Public Health Nursing Course in Singapore was established in 1957 with assistance from W.H.O. The Royal Society of Health Examination Board is also responsible for preparation of the training schemes and the conduct of these examinations. In 1958 the first Health Visitors' Course was started in Singapore under the direction of a W.H.O. Public Health Nurse Educator in the University Wing of the Institute of Health. Since then 5 courses have been held and 60 students have qualified and returned to the different branches of the Public Health Nursing services from which they were drawn. There are therefore two courses for Health Visitors — one in Singapore and one in Kuala Lumpur (the original centre in Penang being transferred to Kuala Lumpur) concurrently in operation.

The above course which is of one year's duration leads to the Health Visitors' Certificate of the Royal Society of Health. Training is carried out for one year and consists of 9 months in the classroom and 3 months of district nursing.

*The Health Visitors' Course, 1964.*—The fifth course commenced in April 1963 and ended on 22nd February, 1964. The examination was held from 18th to 22nd February. 16 candidates entered and 12 passed the examination. Examiners were Dr. B. V. Hassan, Health Officer, Johore; Dr. Nalla Tan, Senior Health Officer (Training and Health Education), Singapore; and Sister Le Mercier, Maternal and Child Health Service.

For the first time, a supplementary examination was arranged and held in August 1964 for the unsuccessful candidates. Three candidates entered, and all passed.

The Sixth Public Health Nursing Course commenced on 20th April, 1964. 35 applications were received (34 from Singapore and 1 Colombo Plan candidate from Thailand). 16 candidates were selected. Since selection, two have withdrawn from the Course. The examination for this Course will be held in early 1965.

(c) (i) *Training Course for Public Health Inspectors-in-Training.*—A departmental course of lectures for Public Health Inspectors-in-Training was held from 12th October to 11th December, 1964, after which a departmental examination was held on the 21st and 22nd December, 1964. Five candidates sat, and 4 were successful.

(ii) *Other Health Auxiliaries.*—Plans to hold a departmental training course for Technical Subordinates in 1965 were finalised, and five Technical Subordinates will attend this course when it commences in January 1965.

(iii) *Refresher Courses.*—For the first time a refresher course was conducted for Public Health Nurses in the Service who do not possess the Health Visitors' Certificate. This refresher course was held from the 31st March, 1964 to the 11th April, 1964 and 10 Public Health Nurses from the



Maternal and Child Health Services attended. The course was a success and plans are in hand to hold this annually and to include in future years Health Nurses from all branches of the Public Health Nursing Service.

The staff of this Unit gave assistance to basic nursing course in the School of Nursing, General Hospital and to the Midwifery Training Course at Kandang Kerbau Hospital.

#### THE HEALTH EDUCATION UNIT

This Unit is responsible for the dissemination of health education to the population in general. Besides this, it conducts training courses and refreshes course in health education for specific categories of health personnel and other categories who can effectively be involved in disseminating knowledge in health. In respect of health education, it is felt that emphasis should be placed on programmes directed to primary school children initially and that later these programmes can be extended to include secondary school children.

The activities of this Unit were widened considerably during the year, and it has now embarked on several projects on an organized basis and has continued with certain projects which were initiated in the previous year. The following are descriptions of projects in the programmes implemented during 1964:

*Health Education of the General Public.*—This was effected: (a) through the Spring Cleaning Campaign which occupied the first five months of 1964, (b) intensive health education was carried out through the press, radio and television.

The campaign was extended into primary and secondary schools. Health squads of older school children were formed in schools. Essay and poster competitions were held in all schools of the 4-language streams and a total of 300,000 children participated. Prizes amounting to \$2,000 were awarded to winning efforts. The Health Education Campaign culminated in a prize-giving ceremony which was held at the Gan Eng Seng School when the Minister for Health, Mr. Yong Nyuk Lin presented gift vouchers to winning pupils.

A series of 31 radio talks were given over radio covering health of mothers, infants, the pre-school child and the school child. There was a series of television interviews also conducted on the same subject during the year.

*Refresher Courses in Health Education for In-service Midwives.*—Three such courses were held in January/February, April/May and October/November. These refresher courses in health education were given in conjunction with the midwives' refresher courses organized by the Midwifery School at Kandang Kerbau Hospital.

*Credit Course in Health Education.*—A credit course in health education for primary school teachers was planned in conjunction with the Ministry of Education. It was conducted from June to October 1964. This course has been commenced with the intention of stimulating teachers to realise the

important part that they can play in dissemination knowledge in health to school children. The course was interrupted by two curfews during the civil disturbances in July and September 1964. 60 teachers enrolled for this course and on completion of the syllabus an examination was held in November 1964. 60 per cent of the candidates, who sat were successful. It is intended that this course be continued in subsequent years.

*Special Lectures for Primary School Children and Young Adolescents.*—A total of 3,600 children from various schools attended lectures on upper respiratory infections and developmental changes at puberty. The lectures were followed by a film show, after which was a question-answer session. This programme was arranged in conjunction with the Ministry of Education, and four main centres were selected. Students from schools in the area attended. The following centres were used:

- (a) Queensway Secondary School — Margaret Drive — 20th June, 1964.
- (b) Raffles Secondary School — Anderson Road — 27th June, 1964.
- (c) Dunman Secondary Integrated School — Off Haig Road — 11th July, 1964
- (d) Cedar Girls Secondary School — Cedar Avenue — 4th July, 1964.

During these talks pamphlets and other handouts were given to every child present.

*Health Education Programmes at Kampong Tulloch.*—At the request of the Army Medical Services at Kampong Tulloch, a series of six health education sessions were held by Malay mothers in the Medical Centre in this Army Camp. This was held in the months of June and July 1964 and was carried out by staff of both the P.H.N. Training Unit and the Health Education Unit.

*Film Shows.*—During the year a programme of film shows was held at Maternal and Child Health Clinics. These film shows were held using a day-light screen in the afternoons during the midwives' sessions when the pace of the clinics was a little slower than usual. 41 such film shows were held. Some clinics were visited twice during the year, and 3 films were shown on each visit. A programme of film shows at community centres was commenced in October. The films shown dealt with general health and a total of 13 film shows were held.

*Preparation and Distribution of Health Education Material.*—During the year a considerable amount of health education material was prepared and printed. Three posters prepared specially in conjunction with the Spring Cleaning Campaign and a pamphlet advising householders in relation to general cleanliness and its effect on health were printed. These were available in the four languages and were widely distributed to community centres, Health Services and all schools in the State through the Ministry of Education in conjunction with the School Health Education Programme, pamphlets for the teachers' use and for school children were produced in large quantities and



again distributed to all schools within the State through the Ministry of Education. In conjunction with the cholera outbreak, two posters were produced: (i) "Wash Your Hands", (ii) "Kill that fly, it could cause cholera". A pamphlet on malaria was produced in conjunction with the malaria outbreak in Fuyong Estate during the year. At the request of the Municipal Health Officer, Kuala Lumpur 40,000 pamphlets and posters in the four languages in Cholera were sent to him.

*General.*—During the year Nurses-in-Training from the School of Nursing and trainees in Family Planning from the I.P.P.F., teachers attending the Credit Course in Health Education, Midwives and Public Health Inspectors visited the Health Education Unit and familiarised themselves with the work that is carried on there.

The activities of the year have shown that it is possible to effectively to educate the public. So far programmes in schools and other special categories have been carried out on a limited basis because of a lack of staff. That staff with an aptitude for Health Education be recruited cannot be too strongly stressed, lectures are also badly needed for the Health Education programmes particularly in schools.

A W.H.O. adviser on Health Education was promised in 1964. This advisor will evaluate existing Health Education programmes and plan extended programmes in furtherance of these services with special attention to Maternal and Child Health, School Health Programmes, the inclusions of Health Education in School curricula and Health Education of the Public in general.

#### SPECIAL ASSIGNMENTS

(a) *Public Health Library.*—During the year, books were ordered and a considerable number of journals were systematically bound and put into the Public Health Library now situated within the Training Unit at the Institute of Health. It is intended that this Library be built up into a comprehensive reference library to be made use of by all categories of personnel in training and to provide information on all matters relating to Public Health.

(b) *The World Health Day Celebrations.*—The Branch participated in the World Health Day celebrations. The theme was "No Truce for Tuberculosis".

(c) *P.A.P. Tenth Anniversary Exhibition.*—The Branch was responsible for putting up exhibits to fill one booth reserved for the Ministry of Health in an exhibition held at the Victoria Memorial Hall from the 20th to 22nd November, 1964. The exhibition booth showed generally, the functions of the various Departments of the Ministry of Health.

(d) *Special Nutrition Survey in Jalan Eunos Settlement.*—This nutrition survey commenced in 1963 and went into its third phase during the year with the systematic lecture/demonstrations on nutrition which were given to Malay mothers originally included in the survey area. Nurses undergoing training in the Public Health Nurses' Course were instructed on what lectures

to give and were responsible for this part of the programme. A series of 16 talks were given. A preliminary report on the first two phases of this nutrition project has been prepared and is available.

During the year the following persons visited the Branch:

1. Mr. Yong Nyuk Lin, Minister for Health in January 1964.
2. Miss L. Turnbull, Regional Nursing Adviser in January 1964.
3. Miss Mum, W.H.O. Health Educator, *en route* to Korea in January 1964.
4. Dr. Chen Yu Chi from Taiwan in January 1964.
5. Dr. Artiero Reyes in March 1964.
6. Mr. Holliday, Chief of Health Education Services in Queensland in July 1964.
7. Miss L. N. Knapp and Miss W. A. B. Holland, Principal Matrons of Sabah and Sarawak respectively in July 1964.
8. Dr. Ian C. Lewis from the Department of Child Health, University of Western Australia in August 1964.
9. Mr. Bovay from W.H.O. Regional Office, Manila, in November 1964.
10. Dr. J. Y. Lu of Taiwan, W.H.O. Fellow in December 1964.



## 12. HAWKERS AND MARKETS DEPARTMENT

### GENERAL

THE Hawkers and Markets Department deals with licensing of hawkers, supervision of public markets, licensing and control of private markets, including private lands used for the accommodation of static hawkers. The Department is under the charge of a Superintendent.

*Administrative and Licensing Section Staff.*—The staff consists of:

- |                                     |                                  |
|-------------------------------------|----------------------------------|
| (i) Superintendent                  | (viii) Four Cashiers (equated to |
| (ii) Two Assistant Superintendents  | General Clerical Officers)       |
| (iii) Two Higher Clerical Officers  | (ix) Six Licensing Assistants    |
| (one post vacant)                   | (equated to General              |
| (iv) Executive Officer (Licensing)  | Clerical Assistants)             |
| (v) Eight General Clerical Officers | (x) Three Office Boys            |
| (vi) Three General Clerical         | (xi) One Messenger               |
| Assistants                          | (xii) One Office Watchman        |
| (vii) Four Typists                  |                                  |

*Number of Licenses and Hawkers.*—There is an estimated total of over 40,000 licensed and unlicensed hawkers in Singapore. Of this number, 5,372 are licensed, giving an approximate ratio of one to eight licensed to unlicensed hawkers. The table below gives the number of licensed hawkers for the years 1960 to 1964 in the City and Rural areas:

		NUMBER OF LICENSED HAWKERS				
		1960	1961	1962	1963	1964
Itinerant						
City Area	...	617	345	441	530	516
Rural Areas	...	—	—	—	78	75
Day Street Pitches						
City Area	...	3,065	2,586	2,515	3,095	3,383*
Rural Areas	...	—	271	331	306	369
Night Street Pitches						
City Area	...	1,198	969	925	971	1,029†
Total		4,880	4,171	4,212	4,980	5,372

\* Excludes 114 licences cancelled during the year.

† Excludes 96 licences cancelled during the year.

For the purpose of this report, the Hawkers and Markets Department may be divided into (a) the Hawkers Section; (b) the Markets Section.



## THE HAWKERS SECTION

The staff of the Hawkers Section consists of —

- (i) two Divisional Hawkers and Markets Inspectors
- (ii) four Senior Hawkers and Markets Inspectors
- (iii) 48 Hawkers and Markets Inspectors (34 posts vacant).
- (iv) 24 Assistant Hawkers and Markets Inspectors
- (v) four Temporary Assistant Hawkers and Markets Inspectors (3-monthly contract)
- (vi) four Assistant Hawkers Inspectors (Rural) (1 post filled by Daily Rated personnel and 3 posts vacant)

*Enforcement.*—During the year, action was taken to clear hawkers from the following streets and hawking sites, either due to their causing serious obstruction or because the sites were required for carrying out road widening schemes. Wherever possible, alternative sites were provided for these hawkers: (i) Jalan Merpati Car Park at MacPherson (South) Housing Estate, (ii) Jalan Cheng Wah, (iii) New Pasar Malam site along Farrer Road, (iv) New Pasar Malam site at East Coast Road near Karikal Lane, (v) New Pasar Malam site at Meyer Road.

*New Specified Sites for Hawkers.*—Hawkers selling at the following new sites and markets were issued licences during the year: (i) Cashin Street, (ii) Pahang Street, (iii) Geylang Road Backlane, (iv) MacPherson (South) Market Open Pitches, (v) Geylang Serai Market, (vi) Bukit Panjang Market Extension, (vii) Tanjong Katong Road Sidelane and (viii) Tanglin Halt (Queenstown IV) Market.

*New Pasar Malam Areas.*—No new pasar malam areas were reported or permitted to operate during the year.

*Complaints.*—During the year, a total of 534 complaints were received about nuisances, obstruction, construction of unauthorised structures, indiscriminate depositing of refuse, etc. by the hawkers and were promptly dealt with by the Department.

*Prosecution.*—During the year, court action was taken in 6,537 cases, and a total of \$33,363 was collected on fines.

NUMBER OF LICENCES ISSUED FOR STREET PITCHES  
AND ITINERANT HAWKERS IN RURAL AREAS

		Street Pitches	Itinerant Hawkers
(i) Bukit Panjang District	...	78	18
(ii) Katong District	...	136	6
(iii) Serangoon District	...	155	51
		—	—
Total	...	369	75
		—	—

## MARKETS SECTION

The Staff consists of:

- (i) one Divisional Hawkers and Markets Inspector (vacant);
- (ii) one Market Inspector (Rural);
- (iii) 37 Market Overseers;
- (iv) six Market Overseers (Rural) (five posts filled by Daily Rated personnel, one post vacant);
- (v) 65 monthly rated watchmen;
- (vi) 224 Labourers (four posts vacant);
- (vii) eight daily rated watchmen (Rural);
- (viii) one Mandore (Rural);
- (ix) 23 labourers (Rural).

*Control of Markets.*—There are 33 markets in the City Area and eight markets in the Rural Areas. They include the new market at MacPherson (South), officially opened by Assemblyman Mr. S. V. Lingam on 9th February, 1964, the new market at Geylang Serai, officially opened by the Prime Minister on 17th April, 1964, and the new market at Queenstown Neighbourhood IV (Tanglin Halt), officially opened by the Assemblyman for Ulu Pandan, Mr. Chan Cheok Hock on 28th November, 1964.

The extension to Bukit Panjang Market was officially opened by Mr. Lee Khoon Choy, Political Secretary to the Prime Minister, on 31st May, 1964.

The lock-up stalls at Upper Serangoon Market were demolished by the Public Works Department in order to provide more accommodation for re-siting the unlicensed hawkers selling in the vicinity.

During the year, 5,311 licences were issued for market stalls in the City Areas, of which 118 licences were cancelled during the year, leaving a total of 5,193 licences in force at the end of the year.

A further 1,139 licences were issued in the Rural Areas.

*Collection of Revenue.*—Total revenue collected by the Department amounted to \$1,740,624.83, of which \$1,563,468.33 came from fees collected in the City Area and the remaining \$177,156.50 from the Rural Areas.

The fees consisted of:

- (i) Street pitches licence fees;
- (ii) Market stalls licence fees;
- (iii) Shelter stalls licence fees;



- (iv) Private markets licence fees;
- (v) Commission on fish auction sales;
- (vi) Itinerant hawkers licence fees.

#### OFFICE ACCOMMODATION AT NO. 21, CANNING RISE

During the year an unprecedented event took place, namely, a fire broke out at the office of the Branch at No. 21, Canning Rise, on Sunday, 11th October, 1964 at about 10 a.m. So far, the actual cause of the fire has not been determined by the Police.

The fire destroyed parts of the building on the first floor and the ground floor store. Most of the office filing equipment, including some contents; office appliances; part of the office furniture and various records were also burnt.

Since the fire had made the building untenable, on 16th October, 1964 the Department started to shift to a temporary emergency accommodation at the first floor of the Registrar of Vehicles Building, Middle Road and the removal was completed the next day.

Towards the end of the year, extensive efforts were made to look for alternative accommodation. After much time and trouble had been taken, suitable accommodation was found in the Malay Crafts School, Scotts Road, which had been scheduled for demolition.

Estimates were obtained from the Public Works Department for the renovation of the building and approval for use of the building for at least 2 years was given by the Ministry of Education recently.

It is hoped that the Branch would be able to move to its new office in early 1965.

*Re-Organisation of the Department.*—Mr. Lim Chooi Sian, Director of the Central Complaints Bureau, was seconded for service with the Ministry of Health to take full charge of the re-organisation of the Hawkers and Markets Department on 16th November, 1964 for a year.

*Formation of Public Health Advisory Board.*—With the dissolution of the *Ad Hoc* Committee on Hawkers towards the end of 1963, the work of this department came within the purview of the Public Health Advisory Board which held its first meeting on 1st June, 1964.

Its terms of reference are as follows:

- (a) To formulate and advise the Minister for Health on simple yet practical and effective measures for the preservation and maintenance of the highest possible public health standards in all its aspects for Singapore,



(b) To give immediate attention to 3 pressing public health problems, namely:

- (i) Collection and disposal of refuse.
- (ii) Hawkers and Markets.
- (iii) Straying cattle on public streets and trespassing of property.

*Conclusion.*—The three administrative posts of the department and all the six senior executive posts of the department have not been substantively filled up as yet, but the morale of the Inspectorate is still good and work was performed throughout the year in a satisfactory manner.

### 13. OTHER SERVICES UNDER PUBLIC HEALTH DIVISION

#### HEADQUARTERS

THE following Sections are directly under the Public Health Division Headquarters administration:

- (1) Public Health Engineering Unit
- (2) Cemeteries and Crematoria Unit
- (3) Labour and Welfare Unit
- (4) Transport Centre.

#### PUBLIC HEALTH ENGINEERING UNIT

The Public Health Engineering Unit had a very active year's work in 1964, especially in environmental sanitation activities, and in assisting the processing of development projects.

(a) *Staffing*.—This Unit is under the charge of a Public Health Engineer assisted by three Supervisors of Public Health Works, three senior grade Technical Subordinates, and ten Technical Subordinates, with a labour force of 112 men. While this Unit is attached to Public Health Division Headquarters, it functions in close liaison with the Senior Health Officer (Environmental Health) and the Health Officer in the rural districts. An organizational chart is at page 55.

(b) *Kampong Sanitation*.—The improvement of environmental conditions in various kampongs by construction of proper drains including the major repairs and construction of anti-malarial drains, rural latrines, stand-pipe aprons, wells, and bin centres is a responsibility of the Unit. A total of 40 kampongs had such environmental sanitation improvements carried out costing about \$105,570 in Labour and materials.

(c) *Wells, Water Tanks and Pumping Installations in Rural Areas*.—The Unit maintains and operates a total of 7 small water supply schemes for small kampongs in the rural areas including one such installation in Pulau Tekong Besar. These small water supply schemes are provided with intake-wells, supplied by sub-soil water and fitted with pumping units to pump water to elevated water storage tanks. Water from these tanks are then distributed to the Kampong, through supply pipes and communal stand-pipes.

(d) *Minor Works*.—The Unit continues to handle the minor works of the Division. With the strengthening of the Unit by a super scale Technical Subordinate and the recruitment of a plumber and an additional carpenter it was able to cope with and fulfill about 75 per cent of the requisitions for minor works from the various branches. Altogether over two hundred requisitions were handled by departmental labour and thirty-six indents were



issued to the Public Works Department and private firms for minor works and repairs.

(e) *Other Assignments.*—(i) *Spring Cleaning Campaign.*—The Unit assisted in fabricating and supplying at short notice, eight wooden ramps for easier discharge of refuse from hand carts.

(ii) *Development Projects.*—The Unit assisted in the planning and processing of all new development projects of the Public Health Division including the preparation and submission of monthly physical and financial progress reports. During the year one M. & C.H. Clinic and four new markets were completed and the Unit actively participated and made detailed arrangements for the opening ceremonies.

(iii) *Public Cleansing.*—The Unit made a detailed study of composting techniques and prepared a preliminary scheme for the composting of Singapore's garbage. It had also assisted in the preparation and revision of the Public Cleansing and Conservancy By-Laws for enactment under the Local Government Integration Ordinance.

(f) *Malaria Control in Jurong.*—The preliminary phase for the control of malaria in the Jurong Industrial area had been assigned to this Unit. The rapidly changing topographical features especially from the 16th milestone Boon Lay Road to Tanjong Kling, due to the intensive civil engineering works including extensive levelling of hills and filling of swamps, required constant surveillance and adequate coverage of the area by heavy oiling.

The dammed up upper reaches of the Sungei Jurong was still brackish and oiling from a boat to prevent the breeding of *A. sundaicus* had to be continued. There were thirty-four *Anopheles* larval survey conducted by the A.M. Surveillance Squad but no dangerous *Anopheles* Larvae were found in this Jurong Industrial area. About 26,880 gallons A.M. oil were used and the cost of oil and labour for 1964 amounted to \$59,000.

#### CEMETERIES AND CREMATORIA UNIT

Government has made available to the public of Singapore approximately 2,061 acres of land for the use of burial/burning grounds and crematoria in addition to the control within the City of 2,220 acres of land as licensed/registered burial and burning grounds.

There are approximately 471 licensed/registered burial and burning grounds in the State. None of these burial grounds are known to have been closed to further burials. Steps are being taken to ascertain the number of these licensed grounds which are insanitary or no longer required with a view to recommending their closure and also the life span of all licensed or registered burial grounds. There are 19 private burial grounds within the city area still in use.

The latest Government burial ground with an area of 1,700 acres of which only 1/16 is developed is at Chua Chu Kang catering for all denomina-



tions; the Chinese, Hindu, Buddhist and Bahai sections are already in use and within the current rate of burials the Christian section is expected to be brought into use in the latter part of 1965 and the Muslim section sometime in 1988.

Details of Government burial grounds/burning grounds and crematoria are as indicated hereunder:

(a) *Chua Chu Kang Cemetery*, Chua Chu Kang Road 15½ m.s. This cemetery caters for all denominations and has been divided into (i) Chinese Section, (ii) Hindu Section, (iii) Buddhist Section, (iv) Bahai Section, (v) Christian Section, (vi) Muslim Section.

(i) Chinese Section: Number of plots available — paying section 897; free section 3,043. Further development is in progress. Of balance of 3¼ acres of land set aside by Government for the reinterment of exhumed remains of deceased persons buried in licensed/registered burial grounds acquired by Government for development, road alignment, etc., another 2 acres are in the process of being developed and marked out. In addition site clearing is in progress in Block 3 to provide for 4,000 graves and part of Block 4 for exhumed remains of war victims.

(ii) Hindu Cemetery: Number of plots available — paying section 1,272; free section 553.

(iii) Buddhist Cemetery: Number of plots available — bodies 1,112; ashes 1,001.

(iv) Bahai Cemetery: Number of plots available — paying section 178.

(v) Christian Section: Development of this section has been held up by the difficulty in finding resettlement areas for the squatters by the Housing Board. However, the Housing Board expected to clear the squatters by January 1965 and an area providing for 5,000 grave plots for the Protestant section, 7,000 for the Roman Catholics should be ready before the end of the year.

(vi) Muslim Section: It is not envisaged to develop this section at the moment as the Bidadari Muslim cemetery has a life span of approximately another 25 years.

(b) *Bidadari Christian Cemetery*, Upper Serangoon Road, 4 m.s. Area — approximately 54 acres (for all Christian denominations). Number of Plots available — paying section Prot. 158; F.R.C. 938; P.R.C. 260; free section nil, number of reserved plots available 792.

It is anticipated that the cemetery would be closed to current burials within the latter part of 1965 after which all burials would take place at Chua Chu Kang (Christian Section) which is at present under development. The free section has been completely buried in and current burials are in between the plots.

(c) *Bidadari Muslim Cemetery*, Upper Serangoon Road, 4 m.s. Area — approximately 60 acres. Number of plots available 38,620, number of reserved plots 130.

The cemetery was completely buried in 1955 and current burials are taking place between grave plots and is expected to last till 1988 after which burials would take place in Chua Chu Kang Cemetery (Muslim Section) which is at the moment occupied by squatters and undeveloped.

(d) (i) *Hindu Cemetery*, Upper Aljunied Road. Area — approximately 24 acres. The cemetery is completely buried in but is currently used for cremation of Hindu and Sikhs.

(ii) *Singhalese Buddhist Cemetery*. Area — approximately 3 acres. Number of plots available — paying section 1,163, free section 128. There is a crematorium for Singhalese Buddhists and an area of  $3\frac{1}{2}$  acres for expansion of the burial ground.

(e) *Infectious Disease Burial Ground*, Upper Serangoon Road, 5 m.s. Area — approximately 6 acres. Number of plots available 3,459. This burial ground is used for burials of dangerous infectious disease cases of all races.

(f) *Bukit Timah Road Christian Cemetery*, Bukit Timah Road, 2 m.s. Area — approximately 22 acres. This cemetery has been closed to current burials since 1909 but there are available 118 reserved plots or family burial grounds held under 999 years lease.

(g) *Bukit Brown Chinese Cemetery*, Kheam Hock Road. Area — approximately 175 acres. This burial ground has been closed to current burials since 1945, but there are available about 1,578 reserved plots or family burial grounds held under 99 years lease.

(h) *Temporary Chinese Cemetery war Emergency Burial Ground*, Coronation Road. Area — approximately 8 acres. This cemetery has been closed to current burials since May 1947.

(i) *Mount Vernon Crematoria*, Upper Aljunied Road. Since the Crematoria came into operation in June 1962, the number of cremations has steadily increased. Sikh corpses which were previously cremated by firewood at the Hindu burning ground are now cremated at the Mount Vernon Crematoria. Cremations among the Christian and non-Christian Chinese Community are also becoming popular.

#### LABOUR AND WELFARE UNIT

During 1964 the Labour and Welfare Unit of the Public Health Division in the Ministry of Health continued to carry out the same function of duties as in the previous two years.

The head of this Unit was designated as Senior Executive Officer (Labour and Welfare). He also acted as Chairman of the First Departmental Works Committee, working in liaison with the Ministries of Education, Culture, Social Affairs and Labour,



The strength of the staff of the Labour and Welfare Unit remained the same as the previous year although the volume of work involved had not been reduced. A proposal for the increase in the establishment had again been submitted. In fact, during the year there had been increase in disciplinary cases in respect of daily-rated employees, and this had caused increase in the work of this unit.

As a result of the issue of Treasury Circular No. 25/64 dated 24th October, 1964, the Labour and Welfare Unit was reorganised into two separate sections, known as the Personnel (Labour) Unit and the Welfare Unit. Henceforth, Personnel Officers will be responsible in all labour matters (except matters pertaining to welfare) connected with daily-rated employees, and their duties shall normally include:

- (a) application of the Labour Legislation and other regulations governing daily-rated employees in their departments;
- (b) assisting in the efficient recruitment, transfer, trade test and promotion of daily-rated employees;
- (c) assisting in the investigation of grievances and disciplinary matters concerning daily-rated employees;
- (d) advise on personnel and industrial relations matters.

The Welfare Officer of this Unit will be responsible for all welfare matters pertaining to daily-rated employees and his duties shall normally include:

- (a) payment of retirement benefits;
- (b) passage and other repatriation arrangements;
- (c) funeral arrangements and expenses;
- (d) unclaimed wages;
- (e) problems of absenteeism;
- (f) overstay on leave;
- (g) indebtedness;
- (h) hospitalisation;
- (i) matters relating to daily-rated porters;
- (j) other general personal and welfare problems of daily-rated employees.

The Interim Report of the Commission of Enquiry on Government Daily-Rated Employees was published during the year, and action was taken to implement the various recommendations submitted in the report on instructions from Treasury (Establishment).



## TRANSPORT CENTRE

(a) *Introduction.*—The Transport Section continued its primary function of providing a central organisation for the control of the fleet of vehicles owned by the Public Health Division during the period under review, entailing the —

- (i) maintenance of a central depot at MacKenzie Road;
- (ii) maintenance of sub-depots in the three Rural Districts;
- (iii) control of the staff, drivers and other employees attached to it;
- (iv) control of the expenditure provided for the maintenance of transport, wages and other expenditure in connection with the running of the Section.

(b) *Staff.—Monthly-rated Staff.*—The monthly-rated staff in its employ during the year at the central depot were as follows: 1 Engineer-in-charge (vacant), 1 Supervisor of Transport, 6 General Clerical Officers, 3 Clerical Assistants, 1 Office Boy, 11 General Purpose, Drivers, 3 Watchmen.

*Daily-rated Staff.*—Three lorry drivers retired on 31st December, 1964. The total number of daily-rated staff excluding those in the three Rural Districts as at 31st December, 1964, was 142.

(c) *Depots.*—There is a central depot at MacKenzie Road and three sub-depots in the Rural Districts, namely: (i) Central Depot, (ii) Sub-depot at Katong District, (iii) Sub-depot at Serangoon District, (iv) Sub-depot at Bukit Panjang/Jurong District.

(d) *Vehicles.*—During the spring cleaning campaign, contract lorries were used to clear the backlog of refuse accumulated at bin centres. The total number of vehicles under the control of the Section was 222 vehicles (excluding one Land Rover SF. 4148 on loan and 5 trailers). During the year, 27 new vehicles were purchased and 17 old vehicles were condemned. Ten old vehicles are maintained temporarily on the road to cope with the increasing demand.

(e) *General.*—The Section continued to supply petrol, oil and lubricants to vehicles of Kandang Kerbau Hospital, and the Abattoirs of the Primary Production Department.

## 14. MALARIA OUTBREAK AT FUYONG ESTATE

### GENERAL

IN August and September 1964, after an absence of 7 years, indigenous malaria reappeared in Singapore in the form of a small outbreak. The site of the outbreak was at Fuyong Estate in the Bukit Panjang District, off 9 milestone, Bukit Timah Road.

*Topography and breeding places.*—This is an area where typical seepages and spring water abound. The foothills and surfaces of slopes are scarred by granite quarries of which there are 5 in this area. In the early part of 1964 due to the activities of private housing developers hill slopes in the vicinity of Princess Elizabeth Estate were cut, thereby exposing seepages to sunlight and coupled with quarry activities in this area, ideal conditions were created for the breeding grounds of one of the main vectors of malaria in Singapore — viz., *A. maculatus*.

For the purpose of anti-malaria operations in the control of this outbreak, an arbitrary area was determined by using the house of the first reported case as the centre, and drawing a rough circle with half a mile radius thereby enclosing approximately 0.8 of a square mile.

Within this area there were roughly 690 houses with about 4,000 residents who were made up of all the 4 ethnic groups.

*The Outbreak.*—The first reported case of malaria in this area was that of a Malay boy of 18 years who was a part-time labourer at Hume Industries. His family migrated from Johore in 1956 and he has remained in Singapore since. There was no history of his having suffered from malaria previously and the last time that he went to the States of Malaya was in April 1964. He left for Pontian one morning and returned to Singapore on the evening on the same day.

This boy was first seen at Thomson Road Hospital on 30th July, 1964 and was diagnosed as a malaria case, which was supported by a “positive” blood film.

The Public Health Inspector investigating the case found that there were 17 other people who had bouts of fever, chills and rigors living in the same kampong during the month prior to this first reported case.

Following this first case, 3 weeks later, a lady medical practitioner in the same area sent a Chinese girl, aged 6 years, who was suspected of having malaria, to the Health Officer at Bukit Panjang/Jurong District Office. A blood film was done and the slide was found to be teeming with *Plasmodium Vivax*.

A house-to-house search was carried out for ‘fever cases’ immediately and blood films were also taken. By these methods 9 cases were found to be



'positive' for malaria. Two of the more serious cases were despatched to hospital as malaria cases.

Subsequently, a medical student following up on a 'social case' of malaria in an infant of 3 months old from a Malay kampong in this vicinity, took blood films of all the 4 members of the same family and found them positive for malaria. Two neighbours were also found to have positive blood films. With these cases, an outbreak of malaria in this area was established.

The following table shows the distribution of malaria cases by ethnic group in the operation area:

Ethnic Group			Total No. of Cases
Chinese ...	...	...	16
Malay ...	...	...	13*
Indian ...	...	...	4
Others ...	...	...	0
Total ...			33

\*4 of these were imported cases.

There were 29 indigenous malaria cases in connection with this outbreak although a total of 33 cases were found on investigation in this area. Four of these cases have definite histories of having visited Johore about 2 weeks before they were discovered and they were found just outside the 'operation area' in Bukit Gombak. These may be treated as imported cases and they have been included in the total because of the proximity to the area of the present outbreak.

*Incrimination of the Vector.*—As the 'operation area' was situated in ideal conditions for the breeding of *A. maculatus*, this was the first suspected vector from the beginning of the outbreak. Vector surveys which include Larvae searching and adult trapping were carried out:

(a) *Larvae surveys* were carried out on 14th August and 15th August, 1964 in the area. Results were:

- (i) *A. maculatus* — in seepages pool from broken subsoil line within the Dairy Farm area (4th instar);
- (ii) *A. Vagus* — in seepage pool;
- (iii) *A. kochi* — in an earth well;
- (iv) *A. aitkeni* — in shaded seepage pool;
- (v) *A. leucosphyrus* — in shaded seepage pool.

(b) *Adult surveys* by the human bait method were done for 3 nights on 24th, 25th and 26th of August, 1964. Only 2 adult *A. maculatus* were caught.

They were not engorged with blood and no Plasmodial parasites were found. No other vectors were caught.

Further larval collections of *A. maculatus* were found in a ravine in the Nature Reserve by the side of the Housing and Development Board Quarry; in the seepages at the fact of Singapore Granite Quarry Ltd., and at the



jungle ravine near the Kramat Habib Ismail off 8½ m.s. Bukit Timah Road. It was therefore confirmed that *A. maculatus* was responsible for the outbreak.

#### *Measures taken to deal with the outbreak*

The measures taken may be divided into Epidemiological and Remedial — i.e. to interrupt the transmission of malaria.

Epidemiological measures consisting of: (i) passive detection; (ii) active detection; (iii) focal blood survey; while Remedial measures consisting of: (i) mass drug administration (anti-parasite); (ii) residual spraying (anti-adult); (iii) oiling and ditching (anti-larvae).

#### *Epidemiological Measures*

(i) *Passive Detection*.—All persons with fever or chills and other suspicious symptoms were asked to report to the Bukit Panjang District Office. The co-operation of private practitioners and Government Outdoor Clinics in the vicinity was obtained to report suspected cases to the District Office for blood examinations. Thus, 2 cases were confirmed through blood examinations.

(ii) *Active Detection*.—A blood survey team of one doctor and five health inspectors carried out house-to-house enquiries for fever cases. Thick and thin blood films were examined for malaria parasites. The following table shows the result of the blood surveys:

Date	No. of slide taken	No. found positive	Percentage positive
28th August, 1964 ...	21	3	14.29
29th August, 1964 ...	23	6	26.09
1st September, 1964 ...	4	0	0
2nd September, 1964 ...	12	1	8.3
3rd September, 1964 ...	5	0	0
9th September, 1964 ...	1	0	0
Total ...	66	10	15.1

(iii) *Focal Blood Survey*.—This was a blood survey of about 50 persons staying in and around the vicinity of confirmed malarial cases, notwithstanding whether they have symptoms or not. Only 9 cases out of a total of 550 persons surveyed were picked out.

Thus, a total of 21 cases was discovered from an estimated population of 4,000 residents, making a parasite rate of 0.52 per cent.

#### *Measures employed to interrupt transmission and eradicate focus of infection (remedial)*

(i) *Mass drug administration (anti-parasite)*.—The drug used was “Camoprime”, which is a combination of a 4-Amino quinoline and a 8-Amino quinoline thus making it effective against both the blood and liver phases of the malaria parasite. Handbills explaining the outbreak and the drug

to be administered were distributed to the residents within the operation area. A team consisting of two doctors and 22 public health inspectors was mobilised for this special operation.

The drug administration programme consisted of three doses to be given at weekly intervals. Symptoms of side effects were recorded, and of more than 4,000 persons, only 45 had side effects. This worked out to about 1 per cent of the population.

(ii) In combination with the above measure, residual spraying of houses and swing-fogging were also done against the adult vector. Both "Gammexane" and "D.D.T." were used in this operation. A total of 690 houses were thus covered over a period of six weeks. For swing-fogging, "Dioldrex 15" was used on bushes, out houses and ravines within the 'operation area'.

(iii) *The attack on larvæ of vector.*—Owing to the terrain and the comparatively big area involved, 30 men were employed and it took over three months to complete proper ditching and clearing of the mud drains in this area. Maintenance work on permanent concrete drains was also carried out. After a ravine was cleared, 'heavy oiling' with anti-malaria oil were done and regular oiling, routine was maintained.

*Results of measures.*—At the end of two months (from the detection of the first case of malaria at Fuyong Estate) the outbreak of malaria was successfully controlled and the transmission and focus of infection eradicated.

*Comments.*—One of the main causes of this outbreak was found to be a breakdown in the routine working of maintenance oiling by the Daily Rated Labour Force in this area. Oiling of ditches and seepages which are the favourable breeding places of *A. maculatus* cannot be effectively done if vegetation and drains are not prepared or cleared properly. Owing to some dissatisfaction among the oilers, there was no proper ditching in this area for some time thereby resulting in ineffective oiling of these breeding places. Malaria parasite reservoirs are ever present just across the Johore Causeway, and with the increase in the breeding of *A. maculatus* it is not surprising that small outbreaks of this nature can and will occur, if control measures are slackened in any appreciable degree. Although outbreaks of this nature are easily controlled, the need for constant vigilance and the fact that there is no room for complacency in the battle against malaria are important lessons to remember here.

SECTION III  
HOSPITALS DIVISION





## 15. INTRODUCTION

THE Hospitals and Outpatient Services form the main components of the Hospitals Division of the Ministry of Health.

The report is given in two parts. In the first part the events of the year which were of significance to the Hospitals Division are described. This is followed by a general summary of the Hospitals and Outpatients Services, the personnel engaged in them and the costs of these services. The second part will consist of the reports of each of the individual institutions.

### PART I

#### EVENTS OF THE YEAR

There is a tendency to magnify the difficulties when looking back through the year as the events are so close and working so close to the problems. There were the continued heavy demands on the service which had to be coped with the limited facilities and a chronic shortage of staff. The staff were also restive, claiming for better conditions of service. Looming in the background was the hostility of the Indonesian neighbour. Whether or not its confrontation would eventually have an effect on the services remained to be seen; but the riots which occurred in July and September probably reflected its sinister influence.

These difficulties and events should not over-shadow the achievements made in the year. Construction on several projects were completed and development planning continued. The re-organisation of the Outpatient Service which was implemented in the middle of the year and the introduction of charges for outpatients and for delivery of babies at the maternity hospital marked a major change in the pattern of the services. That the services were maintained, and that some growth was marked-up and that major changes in organisation were introduced and plans continued to be made for further development was a creditable balance on the whole.

#### DEVELOPMENT

Development was on a modest scale — in comparison with other social development in schools and public housing. Development has chiefly been in the form of extensions and improvements to existing buildings.

The biggest project completed in the year was the surgical block at Thomson Road Hospital. This block housed the surgical operation theatre suites for the General Surgical and the Obstetrics and Gynæcology Unit for the hospital; an X-ray Department and a Casualty and Outpatient Clinic. When fully completed in 1965 the Hospital will finally be a complete General Hospital serving the northern sector of the island. For the present this is



thinly populated but when the new housing development at Toa Payoh is completed the hospital will probably not be adequate.

Also at Thomson Road Hospital, an Assistant Nurse Training School is being built. The building is expected to be completed at the end of 1965 at a cost of \$249,029 and furniture and equipment \$7,520.

At Tan Tock Seng Hospital the Thoracic Surgical Block was nearing completion. It will be completed in the middle of 1965.

The alterations and renovations to wards in the General Hospital for the Third Medical Unit were also nearing completion and the Unit is expected to function in the first quarter of 1965.

Surgical operation theatres were completed for the Eye Unit, General Hospital and at Trafalgar Home. The theatre for the Eye Unit was, in addition to its existing theatre, and therefore, doubled the surgical facilities in the Eye Unit.

The surgical theatre at Trafalgar Home was built in response to the need for theatre facilities in the Leprosy Hospital. Previously, patients had to be operated on at the General Hospital.

An outpatient dispensary was opened at Maxwell Road on 3rd July, 1964. This dispensary was built in a building which was formerly the St. Andrew's Mission Hospital. This building was taken over by Government after the war and its conversion to a dispensary cost \$87,629 and furniture and equipment \$24,000.

This was the only dispensary opened in the year and in contrast to the previous years represents a tailing off in dispensary building until more staff became available.

#### RE-ORGANISATION OF THE OUTPATIENT SERVICES

On 1st August, the Outpatient Service was re-organised. The main changes were the closure of the outpatient departments in the General Hospital and the Kandang Kerbau Hospital.

The Outpatient Department in the General Hospital had grown to the largest of all the outpatient dispensaries. It had, at any one time, at least 21 doctors to man the Department and attracted almost as many patients attending in it as all the other 32 outpatient dispensaries combined. There was a historical reason in its growth to such dimensions. The Outpatient Service had originally been part of the admission room of the General Hospital and when it outgrew its premises several satellite outpatient dispensaries were established and spread throughout the island. In spite of these many other outpatient dispensaries its volume of patients continued to increase. It had reached a stage where the number of patients could not be dealt with and it was already not performing its more important function of dealing with emergencies requiring immediate attention on admission to the hospital.



The outpatient dispensary at Kandang Kerbau Hospital was closed for the same reason.

In the place of the outpatient department at the General Hospital an Emergency/Admission Unit was established as a part of the Department of Orthopædic Surgery (no longer under the Outpatient Service). At the Kandang Kerbau Hospital the outpatient department was converted as an extension of the referral or consultation clinics run by the hospital.

The closure of the two outpatient dispensaries was made good by the opening of the Maxwell Road Outpatient Dispensary so that there are now 31 Outpatient Dispensaries instead of 32, prior to the re-organisation.

With the re-organisation patients were required to attend at the outpatient dispensaries nearest their homes. Patients could attend at the Emergency/Admission Unit only in emergencies or had been referred by practitioners or by the doctors in the outpatient dispensaries.

The other change was the introduction of charges for attendance at all the outpatient dispensaries. Previously, charges were levied only in the former City Council Dispensaries (7 in number) and in the two newly-opened outpatient dispensaries. With the re-organisation, charges were extended to all the dispensaries. Exemptions, however, are given to persons under Social Welfare Aid and those suffering from the Infectious Diseases such as tuberculosis where continued treatment is essential.

In effect, the re-organisation was a decentralization of the services to bring about a more even spread of patients to each of the Outpatient Dispensaries, and to establish Emergency and Consultation Clinics at the General and Kandang Kerbau Maternity Hospital.

#### CHARGES FOR DELIVERIES AT KANDANG KERBAU HOSPITAL

Charges were introduced on 1st December for deliveries of babies which previously had been done free of charge. The charges were at the rate of \$10 for mothers who were Singapore citizens and \$50 for mothers who were non-Singapore citizens. The charges were to replace the toilet articles which mothers previously brought with them on admission. The introduction of charges for outpatients and for deliveries marks a major change in the pattern of Medical Services which hitherto have largely been free.

#### CONFERENCES

There were an unusual number of Conferences which were held during the year. Between the 27th April and 9th May, the American College of Cardiologists conducted a circuit course in Cardiology. The local sponsors of the project were the University's Committee of Post-Graduate Studies. This was an extremely stimulating and interesting Seminar for all those who participated in it.

Between the 6th and 8th June, an Orthopædic Conference was held in Singapore. This was jointly sponsored by the Government and the University

of Singapore, and Surgeons from India, Ceylon, Pakistan, Burma, Japan, Hongkong, New Zealand and Australia, attended this Conference which was so successful that a second Conference will be held again in August 1966.

A symposium on Cancer of the Nasopharynx was held on 1st–7th August. The symposium was organised by the Committee on Geographic Pathology of the International Union Against Cancer (the Union Internationale Contre le Cancer). This was the first U.I.C.C. Conference held in South-East Asia. Singapore was chosen as the venue because of the high frequency of Nasopharyngeal Cancer which occurs in this part of the world and several investigators in these territories have studied the problem for some time. The Conference was held for a week and was attended by scientific workers locally as well as from the neighbouring territories — India, Thailand, Taiwan, Japan, Australia, U.S.A. and even from Hawaai, Kenya, and U.K.

On the 27th and 28th October, a World Health Organisation Multiple Seminar on Radiological Health was held. This was the second in the series of W.H.O. Seminars on this subject, the first of which was held in the Eastern Mediterranean in 1962. The formal lectures, demonstrations and discussions were highly successful and were of great benefit to the staff who work in the Radiological Departments.

#### EXHIBITIONS

Two successful exhibitions were held in the year. The first was held in connection with World Health Day in which the theme was, “No Truce for Tuberculosis”.

The celebrations were spread over a week from 6th April to 12th April, and during this period an Anti-Tuberculosis Exhibition was held in the Victoria Memorial Hall from 7th to 12th April, and opened by the Minister for Health. All sections concerned with the Anti-Tuberculosis Service such as the Tan Tock Seng Hospital, Tuberculosis Control Unit and others were represented.

The other exhibition was that sponsored by the Malayan Pharmaceutical Association and the theme was to show progress in Pharmacy in Singapore. The exhibition was held in the Victoria Memorial Hall from 6th June to 13th June. This was part of a Pharmacy Week.

#### THE RIOTS OF JULY AND SEPTEMBER

The first riots began in the late evening of 14th July, and very soon brought a flood of victims to the Casualty Department of the General Hospital, and also quickly filled up beds in the Admitting Surgical Unit. Casualties continued to come in over the next few days but in gradually decreasing numbers as control was brought to bear.

The sudden imposition of curfew while tending to suppress the riots created great difficulties in running the hospital's services. There was difficulty



in the initial phases for patients to return home after they had been seen in the hospital and on the first night there were a good number of patients who could not return home and who had to be put up in the General Hospital. Added to these was the large number of hospital staff who also could not return home and had to be housed in the hospital. These created their own problems of accommodation and feeding which fortunately, in the case of the patients were improvised with assistance of the Social Welfare Department.

There was also the added problem of getting hospital staff to work during the curfew and sending them back after their duties were over. It was fortunate that dedication to work and a sense of duty prevailed generally and there were many individuals whose devotion beyond the call of duty kept the emergency services going.

It is fortunate that during the period of the emergency the Outpatient Dispensaries were closed and the staff were made available to assist in the Casualty Services. In the other hospitals, work on the other hand, was reduced because there were no new admission of patients. The exception was the Maternity Hospital (Kandang Kerbau Hospital) where deliveries continued, in fact, at higher rates. This probably being due to the fact that persons who might normally have given birth at home or under the care of general practitioners and midwives could not get their medical attendants and therefore had to come to the hospital; most of these in Police vans.

The second riot occurred on the 2nd of September, but these were on smaller scale and were chiefly confined to a small sector of the island. The same problems and difficulties were faced, although, to a smaller degree. By this time, the Outpatient Services had been reorganised and the Emergency/Admission Unit at the General Hospital had been established. This Unit was able to show its mettle and proved the wisdom of reorganising.

The riot victims treated in the hospitals were as follows:

		No. of Casualties treated as Outpatients	No. Admitted	No. Died
Riots (21st–28th July)	...	393	127	23
Riots (2nd–9th September)	...	78	31	13

#### CHOLERA OUTBREAK

The sporadic outbreaks of Cholera caused by the El Tor Vibrio type in 1963 reappeared. There were three outbreaks each with a smaller incidence. This is reported more fully in the Chapter on the Infectious Diseases Hospital (Middleton Hospital). Although these were small outbreaks the number of persons admitted to the hospital for investigation was more than 16 times the actual number of cholera cases, which kept the hospital quite busy and full.



HOSPITALS

*Hospitals Facilities*

There are 11 Government hospitals and six private hospitals which in aggregate provide for 7,451 hospital beds. For a mid-year population of 1.82 million, this is a proportion of 4.3 beds per thousand population and more than 90 per cent of these being provided by Government. A list of the hospitals and the beds available is in Table 55.

In Tables 56 and 57 the proportion of the principal type of hospital beds to the population is given for a 5 year span.

*Hospitals Activities*

The work of the hospitals is recorded in a series of tables which follow. As far as possible these figures are compared with previous years as this may be of interest and may indicate trends in the pattern of the Medical Services for the future.

The records show that there was a slight decrease in the number of patients treated in hospitals. This was due to the two periods of curfew each of about a week, which was imposed during the riots in July and September.

Tables 58 and 59 which is on the average turnover of hospital beds indicates that the whole hospital beds are being put to increasing use and this is at the expense of the length of stay of patients. The length of stay is decreasing. This should not be taken to mean that treatment is entirely more effective and efficient; the heavy demands for hospital beds require that patients are discharged earlier for the more seriously ill.

Table 55

MEDICAL INSTITUTIONS, 1964

<i>Government Hospitals</i>	<i>Beds</i>
General Hospital	... 1,132
District Hospital (Thomson Road Hospital)	... 396
Maternity Hospital (Kandang Kerbau Hospital)	... 443
Tuberculosis Hospital (Tan Tock Seng Hospital)	... 1,320
Venereal Diseases Hospital (Middle Road Hospital)	... 61
Infectious Diseases Hospital (Middleton Hospital)	... 250
Leprosy Hospital (Trafalgar Home)	... 965
Mental Hospital (Woodbridge Hospital)	... 1,869
Mental Defective Hospital	... 45
Chronic Sick Hospital	... 70
St. Andrew's Orthopædic Hospital	... 120
	<hr/> 6,671 <hr/>

*Private Hospitals*

Gleneagles Hospital (General Hospital)	...	80
Kwong Wai Siu Hospital* (Cantonese Community Hospital)	...	454
Mt. Alvernia Hospital (General Hospital)	...	85
St. Andrew's Mission Hospital (Children's Hospital)	...	80
Singapore Nursing Home	...	14
Youngberg Hospital (General Hospital)	...	67
		<hr/> 780 <hr/>

*Institutional Hospitals*

## Prisons Hospitals —

Changi Prison	...	64
Pearl's Hill (January–September)	...	100
(October–December)	...	50
Opium Treatment Centre (St. John's Island)	...	22
Police Advanced Training School Hospital	...	20

\* Hospital provides treatment in both “Western” and Chinese systems of medicine.

Table 56

## NUMBER OF BEDS AVAILABLE, PRINCIPAL TYPES

(The figures exclude beds in Institutional and Departmental Hospitals and Charitable Homes)

	1960	1961	1962	1963	1964
Total Hospital Beds ...	7,232	7,539	7,567	7,573	7,451
per 1,000 population ...	4.4	4.5	4.4	4.3	4.1
Government Hospital Beds	6,582	6,807	6,831	6,827	6,671
per 1,000 population ...	4	4	3.9	3.8	3.6
Private Hospital Beds ...	605	732	736	746	780
per 1,000 population ...	.4	.4	.42	.42	.43
General Beds (Government)	1,627	1,647	1,629	1,627	1,528
per 1,000 population ...	1	1	.94	.92	.84
Maternity Beds ...	390	438	467	443	443
per 1,000 population ...	.24	.26	.27	.25	.24
Psychiatric Beds ...	1,869	1,869	1,869	1,869	1,869
per 1,000 population ...	1.1	1.1	1.08	1.05	1
Tuberculosis Beds ...	1,200	1,234	1,250	1,320	1,320
per 1,000 population ...	.73	.73	.73	.75	.72

Population Mid-Year 1964 = 1,820,000

TABLE 57  
HOSPITAL BEDS IN GOVERNMENT HOSPITALS

	Pre-war	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
General Hospital .. ..	750	550	550	600	700	750	750	800	800	800	957	1,205	1,182	1,191	1,231	1,231	1,231	1,231	1,231	1,132
Thomson Road Hospital ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	396	396	396	396	396*	396
Kandang Kerbau Hospital (Maternity and Gynaecology) ..	180	200	220	240	240	240	240	240	240	240	316	316	316	316	316	390	438	443	443	443
Tan Tock Seng Hospital (Tuberculosis) .. ..	600	400	400	550	572	600	540	565	565	564	564	972	938	1,142	1,144	1,200	1,234	1,250	1,320	1,320
Middle Road Hospital (Venereal Diseases) .. ..	..	60	60	60	68	70	70	70	70	60	65	65	65	65	55	58	61	60	61	61
Middleton Hospital (Infectious Diseases) .. ..	250	250	250	250	250	250	250	250	250	200	200	250	250	250	250	250	250	250	250	250
Trafalgar Home (Leprosy) ..	200	260	347	382	451	536	640	725	790	642	954	973	973	1,023	1,023	1,023	1,023	1,023	1,023	965
Woodbridge Hospital (Mental illnesses) .. ..	2,000	440	700	1,000	1,200	1,600	1,800	1,800	1,800	1,800	1,800	1,800	2,040	2,222	1,869	1,869	1,869	1,869	1,869	1,869
Mental Defective Hospital ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46	46	44	45
Chronic Sick Hospital ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35	35	70	70
St. Andrew's Orthopaedic Hospital	..	60	60	60	65	70	70	78	120	120	120	120	120	120	120	120	120	120	120	120
	3,980	2,220	2,587	3,142	3,546	4,116	4,360	4,528	4,635	4,426	4,976	5,701	5,884	6,329	6,404	6,537	6,703	6,723	6,827	6,671

\*Staffed Beds 180.



TABLE 58

STATISTICS SHOWING ACTIVITIES OF PRINCIPAL HOSPITALS 1964  
HOSPITAL UTILIZATION FACTORS

Hospital	Bed Comple- ment	Average Daily Number of Available Beds	Average Daily Bed Occupancy	Average Percent- age Occupancy	Dis- charges and Deaths	Average Length of Stay (1)	Turn- over per Bed (2)	Deaths	Per- centage of Deaths to total Discharges and Deaths	Total Patient Days
General Hospital .. ..	1,132	1,132	1047.98	92.58	43,851	8.74	38.738	2,522	5.75	383,559
Thomson Road Hospital (District General Hospital) .. ..	396	180	144.00	80.00	4,117	12.80	22.872	322	7.82	52,704
Kandang Kerbau Hospital (Maternity Hospital) .. ..	443	443	443.81	100.23	50,407	3.22	113.786	64	0.13	162,435
Tan Tock Seng Hospital (Tuberculosis Hospital) .. ..	1,320	1,284	1102.80	85.90	5,868	68.78	4.570	538	9.17	403,623
Middle Road Hospital (Social Hygiene Hospital) .. ..	61	61	27.17	44.26	1,055	9.43	17.295	3	0.28	9,946
Middleton Hospital (Infectious Diseases Hospital) .. ..	250	250	126.88	50.80	3,465	13.40	13.860	51	1.47	46,440
Trafalgar Home (Leprosy Hospital) ..	965	965	596.17	61.76	302	722.75	0.313	6	1.98	218,270
Woodbridge Hospital (Mental Hospital) ..	1,869	1,869	3466.55	185.45	2,263	560.65	1.211	125	5.52	1,268,759
Mental Defective Hospital .. ..	45	45	45.00	100.00	2	8235.00	0.044	1	50.00	16,470
Chronic Sick Hospital .. ..	70	70	68.23	97.14	65	384.25	0.929	45	69.23	24,976
St. Andrew's Orthopaedic Hospital ..	120	120	96.23	80.00	188	186.80	1.566	..	..	35,220

TABLE 58—*contd.*  
STATISTICS SHOWING ACTIVITIES OF PRINCIPAL HOSPITALS 1964  
HOSPITAL UTILIZATION FACTORS

Hospital	Bed Comple- ment	Average Daily Number of Available Beds	Average Daily Bed Occupancy	Average Percent- age Occupancy	Dis- charges and Deaths	Average Length of Stay (1)	Turn- over per Bed (2)	Deaths	Per- centage of Deaths to total Discharges and Deaths	Total Patient Days
<i>Institutional Hospitals:</i>										
Prisons: Changi . . . . .	64	64	27.00	42.19	242	40.84	3.781	..	..	9,882
Pearl's Hill from Jan.—Sept. . . . .	100	} 88	44.83	51.14	499	32.88	5.670	29	5.81	16,406
Pearl's Hill from Oct.—Dec. . . . .	50							..	..	3,607
Opium Treatment Centre, St. John's Island	22	22	9.86	45.45	230	15.68	10.455	..	..	
Police Advanced Training School Hospital —(formerly Police Training School Hospital) . . . . .	20	20	2.59	15.00	189	5.02	9.450	..	..	948

(1) Average Length of Stay

=

Total Patient Days

Discharges and Deaths.

(2) Turnover Per Bed

=

Discharges and Deaths

Average daily number of available beds.

TABLE 59

BED TURNOVER IN HOSPITALS\*

Hospital	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
General Hospital ..	29.215	26.825	29.207	29.937	33.244	33.960	33.652	37.063	38.845	38.728
Thomson Road Hospital ..	..	..	..	..	..	..	..	..	19.839	22.872
Kandang Kerbau Hospital (Maternity and Gynaecology) ..	94.446	102.759	114.427	125.826	141.569	123.774	112.308	107.396	113.034	113.786
Tan Tock Seng Hospital (Tuberculosis) ..	4.521	2.639	3.317	3.444	3.858	3.652	3.714	4.076	3.987	4.570
Middle Road Hospital (Venereal Diseases) ..	21.646	21.000	20.923	17.723	21.308	19.896	19.820	22.067	15.459	17.295
Middleton Hospital (Infectious Diseases) ..	17.130	15.708	15.088	15.120	14.564	20.488	16.464	20.348	19.764	13.860
Trafalgar Home (Leprosy) ..	1.108	1.153	1.206	1.162	1.217	1.126	0.965	0.971	0.336	1.566
Woodbridge Hospital ..	1.861	2.051	1.970	1.719	1.972	2.240	2.455	2.713	1.273	1.211
Mental Defective Hospital ..	..	..	..	..	..	..	..	..	0.023	.044
Chronic Sick Hospital ..	..	..	..	..	..	..	..	..	0.643	.929
St. Andrew's Orthopaedic Hospital ..	2.108	2.783	2.917	2.092	2.017	2.141	3.375	2.958	1.200	1.566

\*Figures up to 1962 are for "Crude Bed Turn-over" which is based on:

Total Cases Treated (Patient remaining at the beginning of the year, plus number of patients admitted during the year).

Divided by the average daily number of available beds.

After 1962, figures are calculated:

Discharges and Deaths.  
Average daily number of available beds.



## OUTPATIENT SERVICES

There are two categories of outpatients, which are treated in two different organisations and the report of their attendances are given separately:

- (i) outpatients attending at the Outpatient Clinics of hospitals or hospital units. These Outpatient Clinics are considered speciality clinics where patients are referred for consultations or are seen as follow-up for special investigations or treatment;
- (ii) outpatients who attend at the Outpatient Dispensaries. The Outpatient Dispensary services form a separate organisation and consist of all the Government Outpatient Dispensaries, their Mobile Dispensaries, and Staff Dispensaries. These provide a general practitioner type of service.

Until the re-organisation of the Outpatient Services, it undertook as part of its function, the Admissions and Emergency Service for the General Hospital. Since the re-organisation, these functions have been separated out and are now undertaken by a separate unit known as the Emergency/Admission Unit which is a department of the General Hospital.

The figures for attendances in the Outpatient departments are given in Tables 60 and 61.

TABLE 60  
ATTENDANCES AT OUTPATIENT DISPENSARIES

Dispensaries	1962	1963	1964			
			New	Repeats	Injections and Dressings	Total
Government Outpatient Dispensaries ..	2,744,744	2,773,663	..	..	..	..
Static ..	..	..	(1) 373,762 (2) 169,488	488,341 268,236	382,434 181,106	} 1,890,744
Part-time ..	..	..	12,599	14,778	..	
Travelling Dispensaries ..	195,967	199,154	97,905	74,297	..	172,202
Staff Dispensaries	131,525	194,723	109,197	70,186	91,528	270,911
Total ..	3,072,236	3,167,540	762,951	915,838	655,068	2,333,857

- (1) Attendances 1st January to 31st July.
- (2) Attendances 1st August to 31st December.

Table 61

ATTENDANCES AT HOSPITAL OR HOSPITAL UNIT CLINICS

Clinic		1962	1963	1964	Rate of Attendances per 1,000 Population (*)
General Hospital	...	434,347	367,401	324,587	177.5
Thomson Road Hospital	...	8,874	13,752	18,895	10.3
Kandang Kerbau Hospital	...	189,552	170,148	143,721	79
Tan Tock Seng Hospital	...	478,701	350,905	295,911	162
Middle Road Hospital	...	197,594	185,890	191,765	104.4
Trafalgar Home	...	11,345	13,148	9,457	5.2
Woodbridge Hospitals	...	16,668	20,766	20,558	11
Total		1,337,081	1,123,010	1,004,894	549.4

(\*) Population mid-1964 estimated = 1,820,000

Table 61A

CASUALTY — EMERGENCY UNIT

	1962	1963	1964	
Casualty Unit				{ 1 January—31 July 70,473 1 August—31 December 59,690
Casualty-Emergency Unit	120,014	131,995	130,213	

The total attendances for outpatient in all services have been less than in the previous year. This is due to the riots in July and September when curfew was imposed and when it was not possible for patients to attend at the Outpatient departments then. After the re-organisation, attendances have dropped and this is presumed to be due to the imposition of charges for 50 cents for each attendance. These charges apparently are keeping away persons who are not so sick as to require medical attention. It is too early to tell if attendances will continue to fall, level out or rise.

Personnel

In Tables 62 and 63 is a summary of the personnel working in the Hospitals Services.

Table 62  
PROFESSIONAL PERSONNEL — DECEMBER 1964  
(Hospitals Division)

Designations	Approved Establishment	Total No. Filled	University Officers
<i>Doctors</i>			
Superscale :			
Administrative	...	8	—
Specialists	...	44	13
Senior Registrars	...	60	17
Medical Officers	...	252	—
Housemen	...	55	—
<i>Nursing Staff</i>			
Matron, Grade I	...	4	3
Matron, Grade II	...	13	12
Senior Sister Tutor	...	1	1
Sister Tutors	...	16	16
Nursing Officer Tutor	...	3	3
Nursing Officer, Grade II (Man)	...	1	1
Sisters	...	224	210
Charge Nurses	...	30	21
Staff Nurses and Student Nurses	...	1,383	1,186
Male Nurses and Student Male Nurses	...	244	216
Senior Assistant Nurses	...	7	7
Assistant Nurses	...	931	875
Assistant Nurses (Psychiatric)	...	100	69
Chief Nurse (Man) Div. II	...	1	1
Senior Nurse (Man) Div. II	...	1	1
Nurse (Man) Div. II	...	11	10
Senior Midwives	...	4	4
Staff Midwives	...	157	149
Pupil Midwives	...	230	135
Pharmacists	...	25	22
Senior Dispensing Assistants	...	10	10
Dispensing Assistant	...	94	88
Chief Hospital Assistant	...	3	3
Hospital Assistant, Special Grade	...	14	12
Hospital Assistant	...	41	34
Senior Laboratory Technician	...	1	1
Laboratory Technicians	...	101	100
Superintendent Radiographer	...	1	1
Senior Radiographers	...	2	1
Radiographers	...	40	26
Senior Physiotherapists	...	1	—
Physiotherapists	...	19	19
Senior Occupational Therapist	...	1	1
Occupational Therapists	...	12	11
Senior Almoner	...	1	1
Almoners	...	31	18
Chief Dietitian	...	1	1
Dietitians	...	6	6



TABLE 63  
1964 ESTIMATES—HOSPITALS DIVISION

Institutions	SUPERSCALES				SENIOR REGISTRARS		Medical Officers	Housemen
	“D”	“E”	“G”	Super-numerary “E”	Estab.	Super-numerary		
Headquarters	1	..	..	1	..	21	..	..
General Hospital	..	9	15	..	19	..	76	55
Outpatient Services	..	1	1	..	5	..	101	..
Blood Transfusion Service	..	..	1	..	..	..	1	..
Chronic Hospital	..	..	..	..	..	..	1	..
Kandang Kerbau Hospital	..	2	2	..	3	..	22	..
Middleton Hospital	..	..	1	..	..	..	1	..
Social Hygiene	..	..	1	..	..	..	3	..
St. Andrew’s Orthopædic Hospital	..	..	..	..	..	..	1	..
Tan Tock Seng Hospital	..	1	6	..	4	..	20	..
Thomson Road Hospital	..	..	6	..	5	..	16	..
Trafalgar Home	..	..	1	..	1	..	2	..
Woodbridge Hospital	..	1	2	..	2	..	8	..
Total	1	14	36	1	39	21	252	55

Superscales=52

Sr. Registrars=60.

*Ancillary Services*

In Tables 64 and 65 is given a record of the work in some of the ancillary services in the hospitals. Table 64 covers the X-ray Department, Occupational Physiotherapy Departments, while Table 65 is on the Hospital Ambulance Service.

Table 64

## ANCILLARY SERVICES: ATTENDANCES AND COURSES OF TREATMENT

Hospital	X-ray Department Attendances for Diagnostic X-rays	Courses of Treatment		
		Radiotherapy	Physiotherapy	Occupational Therapy
General Hospital	93,199	41,337	88,128	20,701
Thomson Road Hospital	418	—	7,891	8,198
Kandang Kerbau Hospital	6,858	—	7,185	—
Tan Tock Seng Hospital	83,144	—	16,031	23,980
Middle Road Hospital	—	—	—	—
Middleton Hospital	—	—	3,357	—
Trafalgar Home	—	—	873	33,269
Woodbridge Hospital	3,387	—	—	61,218
Chronic Sick Hospital	—	—	1,391	1,492
St. Andrew's Orthopædic Hospital	—	—	6,790	2,485

Table 65

## HOSPITAL AMBULANCE SERVICE

Hospital	Ambulance Services				
	Number of Ambulances	Number of Calls Answered	Patients Carried	Total Mileage	Average Number of Mileage Per Patient
General Hospital Casualty and Emergency Unit	7	7,789	7,789	91,736	11.78
Thomson Road Hospital (District)	3	—	4,653	29,832	6.4
Kandang Kerbau Hospital (Maternity)	11	2,024	2,024	17,805	8.8
Tan Tock Seng Hospital (Tuberculosis)	3	33	33	266	8.06
Middleton Hospital (Infectious Diseases)	4	1,720	1,540	18,257	11.59
St. Andrew's Orthopædic Hospital	—	—	—	—	—
Trafalgar Home (Leprosy)	3	—	—	—	—
Woodbridge Hospital (Mental)	2	—	—	—	—

The staff working in the Hospitals Services are full-time officers. Like other officers in the Public Service, they do not undertake private practice. Consultants may see private patients in consultations but do not retain fees paid for these services.

There are four specialist doctors who are in private practice who are appointed as honorary consultants. They do not have specified duties in the hospitals but may be consulted by doctors in the hospitals neither are they given any hospital beds to control.

A few general practitioners are employed part-time to work in the Government Outpatient Dispensaries. But the numbers employed are few (6) as the private practitioners generally are not able to find the time away from their practice to take up these appointments.

### *Training*

Training outside the services has continued to be made available. The training schemes have been particularly generous for post-graduate training of doctors, but these have also been extended to Nurses and other categories.

Training is provided by Government study awards but there are also training awards made available by organisations, such as the Colombo Plan, W.H.O. Sino-British Scholarships and others. All these awards are co-ordinated by the Public Service Commission which undertakes to advertise and select the officers.

Table 66 gives the training awards which were provided in 1964.

Table 66

#### TRAINING COURSES

	1959	1960	1961	1962	1963	1964
Government Fellowships ...	6	12	6	5	4	3
Colombo Plan Awards ...	4	—	—	—	—	13
W.H.O. Fellowships ...	—	—	1	4	2	4
Others ...	1	1	—	—	—	1

Departmental training for other categories are shown in Table 67.

Table 67

#### NUMBERS IN DEPARTMENTAL TRAINING

	Total No. in School in 1964	Admitted in 1964	Completed Training in 1964
Student Nurses, Nurses' Training School, General Hospital ...	632	250	149
Pupil Assistant Nurses, Assistant Nurses' Training School, Thom- son Road Hospital ...	340	134	165
Pupil Assistant Nurses, Psychiatric Nursing School ...	70	45	—
Pupil Midwives ...	159	98	67
Radiographers ...	19	10	—
Laboratory Technicians ...	54	24	1
Dispensing Assistants ...	43	11	11

On the 24th of February, Professor S. B. Roy was brought into the service as a W.H.O. Expert to set up a Cardiovascular Investigatory Laboratory. Several Government and University staff were trained by him in the techniques of Cardiac Catheterization and other Cardiovascular investigations. With the establishment of a laboratory, a further step has been taken for the development of Open Heart Surgery in Singapore.

From March through the end of the year a Research Team sponsored by the Cooper Foundation conducted research into pulmonary hyaline membrane disease in new born infants in the Kandang Kerbau Hospital.



*Staff Relationships*

The trend towards organisation of labour extends also to staff working in the Hospitals services. Even the professional officers, such as doctors, dentists, pharmacists, nurses, are organised as trade unions.

During the year, the claims on behalf of the technical officers which include the Laboratory Technicians, were heard through the latter half of the year in the Industrial Arbitration Court. The case had not been concluded at the end of the year.

The dispute on the claims of Nurses was also referred to Arbitration and this case will be heard in the following year.

## EXPENDITURE

Table 68 gives the actual expenditure of the Division. This amounts to \$35,176,556, which represents 50 per cent of the total Ministry's expenditure and 11 per cent of the total expenditure for the State.

Table 68

ACTUAL EXPENDITURE FOR THE YEAR 1964  
HOSPITALS DIVISION

Institutions		Personal Emoluments		Recurrent Expenditure		Special Expenditure	
		\$	c.	\$	c.	\$	c.
Headquarters	...	348,025	50	32,876	14	348	00
General Hospital	...	9,029,760	00	3,376,438	14	52,295	14
Blood Transfusion Service	...	166,776	48	43,151	73	2,896	93
Kandang Kerbau Maternity Hospital	...	3,136,153	61	987,878	29	19,118	82
Thomson Road General Hospital	...	1,007,443	69	315,503	10	11,954	71
Tan Tock Seng Hospital	...	4,443,375	26	1,683,340	74	3,760	08
Social Hygiene	...	446,719	35	125,596	08	1,470	00
Middleton Hospital	...	661,687	00	313,950	22	—	
Trafalgar Home	...	333,846	27	762,049	80	9,548	64
Woodbridge Hospital	...	2,515,733	50	1,176,910	18	8,282	97
Chronic Hospital	...	171,827	97	54,176	15	5,448	00
St. Andrew's Orthopædic Hospital	...	223,350	00	81,755	92	685	33
Outpatient Services	...	2,568,777	40	855,713	08	197,932	82
		<hr/> 25,053,476 03 <hr/>		<hr/> 9,809,339 57 <hr/>		<hr/> 313,741 44 <hr/>	
Percentage Expenditure	...	71 %		28 %		1 %	

For comparison the expenditure of the Division in the previous year is given in Table 69. The actual revenue collected for the year is given in Table 70.

TABLE 69  
STATEMENT OF EXPENDITURE FOR THE YEARS 1962, 1963 AND 1964

	1962		1963		1964	
	Provision	Actual	Provision	Actual	Provision	Actual
	\$	c.	\$	c.	\$	c.
<i>Hospitals Division</i>						
Personal Emoluments ..	23,294,310 00	20,840,231 43	24,332,350 00	23,520,189 36	29,612,980 00	25,053,476 00
Other Charges Annually Recurrent ..	11,632,350 00	9,421,109 50	10,754,140 00	9,707,492 41	10,423,000 00	9,809,339 00
Other Charges Special Expenditure ..	526,480 00	172,359 82	418,650 00	345,079 03	374,000 00	313,741 00
Total ..	35,453,140 00	30,433,700 75	35,505,140 00	33,572,760 80	40,409,980 00	35,176,556 00

Mid-year Population (in millions) ..	..	1,732.8	..	1,775.2	..	1,820
Gross cost per head of Population ..	..	\$ 17.8	..	\$ 18.8	..	\$ 19.2

Table 70

HOSPITALS DIVISION  
ACTUAL REVENUE COLLECTED FOR 1964

		Actual Revenue collected on 1964	
		\$	c.
Hospital charges and fees	...	1,221,729	01
Outpatient Charges	...	414,702	00
Sale of Swill	...	21,852	00
Sale of Articles and Stores	...	26,361	40
Contribution by Australian Government for treatment of patients from Christmas Island	...	25,000	00
Payment by Housing and Development Board for medical treatment of staff	...	11,000	00
Payment by the Public Utilities Board for medical treat- ment of staff	...	55,000	00
Rents from Government Buildings (Canteens and bookshops)	...	30,694	00
Rents from Government Quarters	...	326,536	72
Miscellaneous Receipts	...	10,681	09
Miscellaneous (Recoveries, service charges, etc.)	...	33,419	73
Total		2,176,975	95



## 16. OUTRAM ROAD GENERAL HOSPITAL

THE hospital is now known as the Outram Road General Hospital to distinguish it from the other general hospital at Thomson Road. It retains its premier position by virtue of being an older institution with well established departments; a teaching centre for medical and dental students; nurses and other ancillary services.

In association with the Faculty of Medicine, University of Singapore, the hospital provides training facilities for medical and dental students. Facilities are also provided for the training of student Nurses, Laboratory Technicians, Dispensing Assistants and Radiographers. Post-Basic Courses are also conducted for trained Nurses in Ward Administration, Pædiatric Nursing and Operating Theatre Techniques.

The Clinical Units of the hospital are the two General Surgical Units, two Orthopædic Units, two Medical Units, two Pædiatric Units, an Eye Unit and an Ear, Nose and Throat Unit. The other departments and ancillary services are represented by the Radiology and Radiotherapy Departments, the Anæsthetic Department, the Biochemistry Department, the Clinical Laboratories, Dispensaries, Physiotherapy Department, Occupational Therapy Department, Artificial Limb Workshop, an Almoner's Service and the Dietary and Catering Services.

Situated within the hospital are the Blood Transfusion Services, Pathological Services, Department of Dentistry and the Dental School.

### DEVELOPMENT

Work continued on the renovation and alteration of a section of the Bowyer Block for the establishment of the Third Medical Unit. General painting and colour washing of all the hospital buildings have been completed giving the hospital a pleasing appearance.

The Cardiovascular Laboratory, for diagnosis of lesions of the heart and major blood vessels, was established in February 1964. Preliminary training of the surgical team for open-heart surgery is progressing well.

On 1st August, 1964 with the re-organisation of the Outpatient Services the General Outpatient Dispensary and the Headquarters of the Outpatient Services, which occupied an out-building were moved to Maxwell Road and in its place was established an Emergency Unit primarily meant for the treatment of acute medical, surgical cases and traumatic cases.

*Staff.*—The Medical Superintendent of the Hospital is Dr. S. N. Kapur,

*Clinical Units.*—The Clinical Units of the hospital and their Heads of Departments are as follows:

General Surgical Unit 'A' — Prof. L. F. Tinckler, M.B., Ch.M., L.R.C.P., F.R.C.S., D.T.M.H.

General Surgical 'B' — Mr. Y. Cohen. F.R.C.S.

Orthopaedic Unit 'C' — Prof. D. R. Gunn, M.B., Ch.B., M.Ch., Orth., F.R.C.S. (Ed.).

Orthopaedic Unit 'O' and Emergency Unit — Mr. D. W. C. Gawne, M.A., M.D., M.R.C.S. (Ldn.), F.R.C.S. (Ldn.), L.R.C.P., M.B., Ch.B.

Medical Unit I — Prof. G. A. Ransome, F.R.C.P., M.R.C.S.

Medical Unit II — Prof. E. S. Monteiro, C.B.E., M.D., D.C.H., F.R.C.P., F.R.F.P. & S. (Glasgow).

Ophthalmic Unit — Mr. Loh Choo Kiat, F.R.C.S., D.O.M.S.

E.N.T. Unit — Vacant.

Pædiatric Unit (West) — Prof. Wong Hock Boon, M.B.B.S., D.C.H., F.R.C.P. (E.)

Pædiatric Unit (East) — Dr. Quah Quee Guan, L.M.S., M.R.C.P.E., D.Ch. till 30th November, 1964.

Dr. Tan Kwang Hoh, M.B.B.S. (H.K.), M.R.C.P. Ed. D.Ch. Pæd. from 16th October, 1964 (Ag. Head.).

X-Ray (Diagnostic) — Dr. F. Y. Khoo, D.M.R.D.

X-Ray (Therapeutic) — Dr. Chia Kim Boon, D.M.R.T.

Anæsthetic Unit — Dr. B.E.G. D'Bras, F.F.A.R.C.S.

#### ACTIVITY

During the year 43,795 patients were admitted to the hospital (discharges and deaths numbered 43,851) compared with 47,826 patients in 1963 and 44,661 in 1962. The decrease in the patients is partly attributable to the two periods of curfew during the civil disturbances in July and September 1964 and partly due to the dispersal of the General Outpatient Clinic which was functioning at the Hospital until 31st July, 1964.

Table 71

#### PATIENT MOVEMENT

Authorised Bed Complement	...	1,132
Available Staffed Beds	...	1,132
Number of Admissions	...	43,795
Number of Discharges	...	41,329
Number of Deaths	...	2,522
Average Daily Bed Occupancy	...	1,048
Patients Days	...	383,559
Percentage of Deaths to Total Discharges and Deaths	...	5.75%

Attendances at the Outpatient Clinics run by the Clinical Units of the hospital totalled 324,587. The Casualty Department of the hospital which was re-organised on 1st August, 1964 as the Emergency Unit dealt with a total attendance of 130,163 during the year (70,473 attendances for period 1st January, 1964 to 31st July, 1964 and 59,690 attendances for period 1st August, 1964 to 31st December, 1964).



Table 72

## ADMISSIONS 1964

Units	Number of Admissions	
Surgical <i>A</i> Unit	...	7,807
Surgical <i>B</i> Unit	...	7,534
Orthopædic Unit ' <i>C</i> '	...	2,855
Orthopædic Unit ' <i>O</i> '	...	1,500
Medical Unit I	...	4,591
Medical Unit II	...	5,225
E.N.T. Unit	...	1,109
Ophthalmic Unit	...	1,914
Pædiatric Unit (West)	...	5,790
Pædiatric Unit (East)	...	5,468
Total	...	<u>43,793</u>

Table 73

## UNIT OUTPATIENTS FOR 1964

Clinical Units		New Cases	Re-Attendances	Total	Dressings and Injections
Surgical ' <i>A</i> '	...	16,812	41,311	58,123	19,506
Surgical ' <i>B</i> '	...	13,854	17,044	30,898	17,694
Orthopædic ' <i>C</i> '	...	11,869	25,907	37,776	20,801
Orthopædic ' <i>O</i> '	...	9,856	22,422	32,278	16,615
Medical Unit I	...	874	24,903	25,777	9,706
Medical Unit II	...	1,701	25,912	27,613	15,080
E.N.T.	...	7,622	18,252	25,874	4,689
Ophthalmic	...	9,249	36,919	46,168	—
Pædiatric Unit (West)	...	4,904	16,202	21,106	1,619
Pædiatric Unit (East)	...	3,608	15,366	18,974	2,055
Total	...	<u>80,349</u>	<u>244,238</u>	<u>324,587</u>	<u>107,765</u>

Table 74

## EMERGENCY UNIT — 1964

(From 1st August, 1964 to 31st December, 1964)

New Cases	Re-Attendances	Total
55,457	4,233	59,690



Table 75  
HOSPITAL INPATIENT SERVICES 1964

Department (e.g. Medical, Surgical, Orth., etc.)	Bed Com- plement	Average Daily Number of Available Beds	Average Daily Bed Occupancy	Average Percent- age Occupancy	Discharges and Deaths	Average Length of Stay	Turnover per bed	Deaths	Percent- age of deaths to total Discharges and Deaths	Total Patient Days
Surgical 'A' Unit ..	152	152	149	98.03 %	7,960	7	52	407	5.11 %	54,670
Surgical 'B' Unit ..	175	175	158	90.29 %	7,459	8	43	343	4.60 %	57,683
Orthopædic 'C' ..	97	97	98	101.03 %	2,914	12	30	69	2.37 %	35,884
Orthopædic 'O' ..	57	57	67	117.54 %	1,609	15	28	39	2.42 %	24,666
Medical Unit I ..	106	106	125	117.92 %	4,395	10	41	511	11.63 %	45,869
Medical Unit II ..	131	131	139	106.11 %	5,188	10	40	578	11.14 %	50,946
Ear, Nose and Throat Depart- ment ..	60	60	41	68.33 %	1,169	13	19	67	5.73 %	14,925
Ophthalmic Unit ..	72	72	74	102.78 %	1,914	14	27	5	0.26 %	27,198
Pædiatric Unit (West)	141	141	95	67.38 %	5,796	6	41	279	4.81 %	34,854
Pædiatric Unit (East)	141	141	101	71.63 %	5,447	7	39	224	4.11 %	36,864
Total ..	1,132	1,132	1,048	92.58 %	43,851	9	39	2,522	5.75 %	383,559

The following is a summary of the operations done in the Surgical Units of the hospital:

Table 76

## OPERATIONS FOR 1964

Units		Major	Minor	Total
Surgical 'A' Unit	...	3,071	6,304	9,375
Surgical 'B' Unit	...	2,449	6,035	8,484
Orthopædic Unit 'C'	...	1,365	11,979	13,344
Orthopædic Unit 'O'	...	1,183	10,880	12,063
E.N.T. Unit	...	1,223	2,670	3,893
Ophthalmic Unit	...	1,487	6,286	7,773
Total	...	<u>10,778</u>	<u>44,154</u>	<u>54,932</u>

## MEDICAL UNIT I

*Accommodation and Equipment*

During the year under review, the Cardiovascular Laboratory came into full function as a consequence of the arrival of Professor Sujoy B. Roy, W.H.O. Consultant and Visiting Professor of Cardiology, University of Singapore.

A little additional equipment was purchased in the form of Catheters of various sizes, including left heart catheters.

A Radio-isotope Laboratory was established as a result of a generous grant from the China Medical Board of New York to the Departments of Medicine and Clinical Medicine. Some of the equipment unfortunately arrived severely damaged so that the Laboratory is still unable to function properly. Replacements are in the process of being obtained. The equipment is at present housed in the Radiotherapy Department.

*Research*

Work on Eosinophilic Lung consists mainly of providing some clinical material for study by the Department of Parasitology, University of Singapore and the Department of Medicine, University of Malaya, Kuala Lumpur. This is a continuation of the previous work.

Hæmorrhagic Dengue Fever is now a well recognised entity. Three types of dengue virus have so far been identified from 18 virologically proven cases.

The study of oral treatment of diabetic patients with the complications of pulmonary tuberculosis is still in progress.

A new study was initiated on the efficacy of two new anti-diabetic drugs — Dimelor and D.B.I. A report is to be published in the near future.

Clinical evaluation of liver enzyme tests is being undertaken in conjunction with the Government Biochemist. Interesting results are beginning to emerge which indicate that a differentiation might be possible between certain types of disease on the basis of these tests.



With the establishment of the Cardiovascular Laboratory the following studies are being conducted:

- (a) Clinical and Hæmodynamic correlation of Pulmonary Hypertension, in patients with mitral stenosis;
- (b) Hæmodynamic patterns in left to right shunt;
- (c) Pulmonary Arterial Hypertension in Atrial Septal defect;
- (d) Intracardiac Electrography in Congenital Heart disease.

Actual work in this laboratory began on 28th February, 1964. Between then and the end of the year the following investigations had been performed:

Cardiac Catheterizations	...	249
Angiocardiograms	...	36
Phonocardiograms	...	228
Dye Dilution Study	...	74
Intra Cardiac Electrography	...	42

During the period of six months up till August 1964, various members of staff from other Units and other Hospitals received training in cardiovascular investigations in this laboratory. This team, under the guidance of Professor Roy was also responsible for Seminars and Symposia on the following subjects: Mitral Stenosis, Continuous Murmurs, Pulmonary Hypertension, Modern Cardiovascular Diagnostic Methods in Singapore.

### *General*

During the year the load of work continued to be heavy both in relation to inpatients and outpatients. A summary of cases seen in the Unit Out-patient Clinic is given below:

		1963	1964
New Cases	...	688	874
Repeats	...	24,005	24,903
Injections	...	8,867	9,706
Dressings	...	12	—

These figures do not include the cases referred for an opinion only where the cases are not followed-up in the Unit. These amount to more than 3,000 per year.

The establishment of the Emergency Unit in this hospital has improved the lot of the patient, but has not relieved and, in fact, has increased the work-load of the Medical Unit as work which formerly was undertaken by the General Outpatient doctors is now passed on to the doctors of the Unit on duty for the day.

### E.C.G. DEPARTMENT

Work continued to mount, and the department is dangerously understaffed. Of the two members of staff in this Department, one has been seconded from the Laboratory. Twice during this year the Department has had to be closed down due to illness of one officer when the other was on vacation



leave until the officer on leave was recalled. At present the work-load is coped with only because the Cardiovascular Laboratory has had a temporary set-back from equipment failure and the staff from this laboratory have been helping in this Department. However, they are University staff.

The following are the returns of work done in the Department:

	1963		1964	
Basal Metabolic Rate	2,803		2,380	
E.C.G. Standard	700	}	409	}
E.C.G. Direct Written	4,572		6,206	
E.C.G. Portable	960		1,243	
Electroencephalograms	155		256	
Phonocardiograms	193		98	
Vital Capacity Tests	13		2	
Skin Temperature	2		—	
Tape Recording	3		1	
Resting Ventilation Estimation	1		—	
Lung Function Test	—		1	
Tendo-Adults Jerk grape	—		1	

### SURGICAL UNIT 'A'

During the tragic events of the civil disturbances in July and August, the Unit played a prominent part in the overall hospital effort in dealing with the sudden and large influx of casualties.

With the establishment of the 'E' Unit, surgical outpatient referral clinics are now being held there for one half day session a week. Previously, these clinics were held in the precinct of the Unit; the new arrangement is a decided improvement by serving to remove some of the congestion in the central hospital area.

The combined surgico-pathological conferences held jointly with 'B' Unit and started early in the year continued to be well attended and supported. These meetings are held in the Pathology Lecture Theatre on the last Tuesday of the month.

#### *Cardiac Surgery*

Work on the development of open-heart surgery was pursued along two main lines:

1. Experimental cardio-pulmonary bypass in dogs.
2. Raising of public funds to support the programme.

Through the generous assistance of Professor Lin of the Department of Pharmacology, and the Veterinary Surgeons at the Animal Infirmary, experimental work on cardio-pulmonary bypass in dogs was carried out throughout the year. A total of thirty-nine animal perfusions were performed. The animal experimentation was designed to study the effects of cardio-pulmonary bypass using various diluted blood mixtures as perfusates, and also to train a team for clinical open-heart surgery. The latter objective was adequately realised and it is anticipated that clinical open-heart surgery will be embarked upon early in 1965.

A generous grant of \$25,000 was made by the China Medical Board for the purchase of a four-channel monitor, a pace maker, a defibrillator and a respirator. These will be used for the care of cardiac patients both during and after surgery.

### SURGICAL UNIT 'B'

The work done on the Unit is shown in outline in the figures given below:

	Admissions	Average Occupancy
Wards 11 and 12	... 527	33
Ward 7	... 4,304	75
Ward 9	... 2,703	50
Surgical Outpatients — New Cases	... 13,854	
— Repeats	... 17,044	
Injectons and Dressings	... 17,694	
Major Operations	... 2,449	
Minor Operations	... 6,035	

It should be noted that there has been a considerable drop in the out-patient attendances, both in new cases and repeats. This is due to the establishment of 'E' Unit which has reduced the burden of minor outpatient work which was so trying at one time.

The departure of Dr. Gellei from the Department of Pathology has been a considerable loss to us. However, the weekly clinico-pathological conferences continue with Dr. Tan Kheng Khoo at the helm. These meetings still continue to be very valuable from the point of view of the patients management and teaching. The monthly inter-Unit meetings with the Professorial Surgical Unit continue.

Work on the Thomson Road Hospital theatres was completed and these theatres were now functioning.

### ORTHOPÆDIC SURGERY 'O' AND 'C'

The work of the Unit has been reduced by about 20 per cent. This is due to a reduction in the number of new cases and a reduction in the number of outpatients.

#### STATISTICS FOR 1964 OUTPATIENTS DEPARTMENT

		"O"	"C"
New cases	...	9,856	11,869
Re-attendances	...	22,422	25,907
Dressings and Injections	...	16,615	20,801
Total	...	<u>48,893</u>	<u>58,577</u>

This can be attributed to the formation of the Emergency Unit at the General Hospital, where all Minor Cases are being treated, and a considerable number of the more severe cases, not requiring hospitalisation are also being dealt with by the 'O' Unit Staff.



The Traumatic Unit, portion of the Emergency Unit is manned by the 'O' and 'C' Units Medical Officers on duty who are always available to assist the Casualty Officers. There is thus, a continuity amounting almost to an "accident" service, between the Emergency Unit and the Orthopædic Units. This will be developed further in 1965. It will be noted that there has been a considerable reduction in the number of accidents in "R.H.I.S.M." Statistics since August. This is because a greater number of accidents are being treated in the Emergency Units, and fewer required treatment in the 'O' Unit and 'C' Unit.

## ANNUAL STATISTICS OF CASUALTIES — 1964

Month		R	H	I	S	M	Total
January	...	91	256	132	14	324	817
February	...	135	257	73	14	272	751
March	...	115	269	104	15	317	820
April	...	86	252	94	27	381	840
May	...	105	233	98	29	359	824
June	...	110	215	88	22	373	808
July	...	78	185	83	22	179	547
*August	...	72	76	48	18	121	335
September	...	67	111	50	11	114	353
October	...	90	133	77	22	150	472
November	...	73	174	72	23	133	475
December	...	64	122	57	7	145	395
Total	...	1,086	2,283	976	224	2,868	7,437

## TOTAL NO. OF CASUALTIES RESULTING FROM:

Road Traffic	...	1,086
Home	...	2,283
Industrial	...	976
Sports	...	224
Miscellaneous	...	2,868
Total	...	7,437

\* "E" Unit inaugurated. The drop in figures from this time is notable.

The reduction is of considerable advantage to patients, as well as to the Medical Staff. It means that patients can be detained a few days longer in the Wards, and that the Doctors have more time to treat them. It means also that more time can be devoted to organisation and efficiency in the Unit as a whole.

A system of Statistical Analysis has in consequence been introduced. This is of the greatest importance, since it enables the Unit rapidly to assess the type of accident occurring, the kind of treatment being given, its effectiveness, mortality figures, and not least, data for research projects.

The whole department was re-decorated in lighter colours. This has given a considerable fillip to the morale in the Unit, both to the Doctors and patients. Although re-decoration in the lighter colours may require to be done more often — this is far outweighed by the effects on patients whose cheerfulness, and on Staff, whose efficiency has much increased. The effect



has to be seen to be believed. Re-wiring of the department has also been carried out. This has been a valuable measure; since short circuits and fuses blown no longer occur. As this Unit depends much upon electrified equipment for its function, efficiency has been markedly improved in this respect. The operating theatres are in a bad state of disrepair. The worst feature is the mal-functioning of the Air-Conditioning machinery. Breakdowns are frequent, air pressure is low, and in consequence the number of organisms have been rising steadily.

<i>Bacterial Counts:</i>					Plates exposed. 2 mins. and 5 mins.	
					2 mins. exposure	5 mins. exposure
25-10-64	Theatre	A	Staphy	Aureous	2 Colonies	3 Colonies
25-10-64	Theatre	B	Staphy	Aureous	1 Colony	2 Colonies
20-11-64	Theatre	A	Staphy	Aureous	2 Colonies	5 Colonies
20-11-64	Theatre	B	Staphy	Aureous	1 Colony	2 Colonies
15-12-64	Theatre	A	Staphy	Aureous	3 Colonies	5 Colonies
15-12-64	Theatre	B	Staphy	Aureous	1 Colony	3 Colonies

This shows a steady increase in the number of Staphy lococci insensitive to antibiotics, as well as other contamination Bacillus Proteins, Fringe, etc. It is important that the bacterial counts be reduced, as it means that they are “Hospital” organisms, insensitive to Antibiotics. Moreover, the introduction of these organisms into wounds increase patients’ stay in Hospital.

*Tetanus Unit*

A side Ward in ‘O’ Unit has been set aside for the treatment of Tetanus. This was necessary as the mortality rates were high. Although it is wrong from all points of view to treat Tetanus cases in an Orthopædic Ward, because of the danger of cross infection, which may lead to fatalities, the risk was considered justified in view of the high mortality figures in the Hospital (See Dr. Gwee Ah Leng’s study of Tetanus in General Hospital *Malayan Medical Journal* 1961).

The risk has been justified in so far that an interim reviewed indicates that the mortality figure of 17 per cent is among the lowest in the world. This has been almost entirely due to the efforts of Dr. Ganendran, having advised in the organisation; trained the Nursing Staff, and introduced new methods of treatment.

*Limb Centre and Appliance Workshop*

The workshop is still without a Superintendent, the Senior Appliance Maker is in acting in this post. The work has steadily risen during the past five years. Annual production has risen in 1964 to approximately \$72,000 in value. The total expenditure in wages and materials has been approximately \$60,000. Collections in cash amounted to twenty-two thousand dollars (\$22,000).

The cost of keeping the Workshop functioning is therefore in the region of forty thousand dollars (\$40,000). This expenditure is well worth while, when it is considered that seventeen hundred appliances have been made. These appliances in the open market would have cost the Government about one-third more; with no guarantee of satisfaction.

The appliances moreover mean a considerable man-power increase, since many of the patients fitted with appliances are able to work.

*Further Developments in the Unit required*

Although pressure of bed space has been relieved, there is still a shortage for emergencies. An increase in bed space is necessary. Two Wards have become available now for development, as soon as staff is available for opening them.

The Gymnasium is no longer in use, since the Orthopædic patients are now attending the Hospital physiotherapy department for their exercises. This centralisation has enabled a better co-ordination of treatment. It is important that a Medical Physical Therapy Officer be trained soon, so that all departments can be co-ordinated, occupational therapy, physiotherapy and rehabilitation under one head.

*Rehabilitation*

It will be necessary to obtain an Officer trained in Physical Medicine to co-ordinate all departments before Rehabilitation can be effective. An Officer will require at least one and half years training. This can only be done in England at the present time, where a Course has been inaugurated at the Royal College of Surgeons.

REHABILITATION AND GYMNASIUM WARD 62

Nationalities			NEW CASES				REPETITIONS			
			'C' Unit	'O' Unit	Others	Total	'C' Unit	'O' Unit	Others	Total
Chinese	..	..	391	439	38	868	3,756	4,466	687	8,909
Malays	..	..	44	67	4	115	318	514	58	890
Indians	..	..	69	78	7	154	635	786	174	1,595
Eurasians	..	..	4	6	..	10	28	97	..	125
Europeans	..	..	2	1	..	3	30	7	..	37
Others	..	..	5	2	..	7	48	59	..	107
Total ..			515	593	49	1,157	4,815	5,929	919	11,663

*New Cases:*

Fractures and Dislocations	...	853
Amputees	...	67
Post — Polio and Spastics	...	16
Paraplegics	...	6
Hemiplegics	...	31
Miscellaneous	...	184
Total ...		1,157



*St. Andrew's Orthopædic Hospital.*—Regular visits continue to be made and satisfactory supervision of all cases is again possible as Dr. Paul has returned to duty as Medical Officer.

The pattern of diseases treated has continued to change tuberculosis of bone and joint now being a relatively minor problem.

*Tanah Merah Red Cross Home.*—Mr. V. K. Pillay has visited the home regularly and has, with the help of the full time physiotherapist, achieved a great deal. The Matron and staff continue to do a wonderful job.

*Trafalgar Home.*—Mr. K. H. Yeoh makes weekly visits to Trafalgar Home and a lot of surgery has been successfully undertaken.

*Middleton and Tan Tock Seng Hospital.*—Regular visits are made to both these hospitals and patients continue to be transferred to the General Hospital for surgery as and when needed.

*Research.*—The following are some of the subjects in which active research is taking place:

- (1) The Epimediology of Fractures, specially in relation to the Hip and the Forearm. This is an extension and long term project which will continue for several years.
- (2) The Incidence Ratio Pattern and Genetic Aspects of Congenital Deformities in Singapore.
- (3) The Importance of the Absence of Primary Osteoarthritic Change in Singapore.
- (4) Genu Recurvatum.
- (5) The End Results of Fractures of the Patella and Fractures of the Femur.
- (6) Popliteal Cysts, their Etiology and Treatment.
- (7) Tendon Transplantation in relation to several different procedures.
- (8) The Use of De-Proteinised Non-Antigenic Bone for Grafting. The Material for this clinical trial has been provided by Squibb.

There are other long term research projects in which work is being continued.

#### OPHTHALMIC UNIT

There was a small decrease in the number of patients attending the Unit in 1964.

		1963	1964
Total new patients	...	10,261	9,249
Old patients attendances	...	42,007	36,919

This is readily explained by two factors: removal of the General Out-patients Department from the General Hospital to Maxwell Road and civil disturbances in July and September.

		1963	1964
Major operations	...	1,457	1,326
Minor operations	...	6,793	6,286
Emergency surgery	...	251	161
Total	...	<u>8,501</u>	<u>7,763</u>



The same factors mentioned above explains the small decrease in the surgical work done by the Unit.

The extension to the Major Theatre is to all intents and purposes complete and the work was done within the specified time of the contract. Equipment and other smaller details in construction will be taken up in 1965. It is hoped that with the new extension to the Theatre the waiting list for cataract surgery will be cut down from the present 6 months to a reasonable period of 3-4 months.

The number registered newly blind for 1964 was 91. Optic Atrophy showed the greatest number. 20 new cases were registered blind due to this cause. The other significant causes were Glaucoma, Inflammations of the Uvea and corneal diseases.

The Unit, at the end of the year, has got its full complement of Medical Officers. The notable shortage is in the nursing staff, especially for the Theatre.

Mr. R. C. K. Loh was invited by the Australian Government to attend Asia-Pacific Academy's International Congress in Ophthalmology in Melbourne in April 1964. He read a paper on the "Decline in the Incidence of Keratomalacia in Singapore". It was also decided at that Congress that the next Congress in 1968 would be held in Singapore. This is a significant honour.

### *Research*

A paper "Adeno-Virus Conjunctivities in Singapore" jointly written by Dr. Coggrave (Department of Bacteriology, Faculty of Medicine) and Mr. Loh has been sent for publication in the American Journal of Ophthalmology.

A paper on the "Use and Abuse of Contact Lenses" was jointly published by Mr. Loh and Mr. Lim in the Singapore Medical Journal. "The use of Preserved Corneae for Lamellar Keratoplasty" written by Mr. Loh was also published in the Singapore Medical Journal.

Investigations continued on these problems: (a) glaucoma, (b) partially sighted, (c) congenital causes of blindness, (d) traumatic injuries and (e) detachment of the retina.

A notable event was the gift of six eyes from the Ceylon Eye Donation Society. These were received in Singapore within 24 hours after removal in Colombo. Five of these eyes were used for corneal grafting on five patients. These were all performed within 48 hours. The results obtained were good.

The draft legislation for the purpose of legalising donations of eyes for corneal grafting is almost completed and should be ready for presentation in 1965.

## EAR, NOSE AND THROAT SURGERY UNIT

### *General*

1964 has been a very eventful year for the E.N.T. Department. Negotiations between the Singapore and Australian Governments led to an exchange scheme (Colombo Plan) whereby Dr. Jerry Goh Ewe Hong went to the Royal

Melbourne Hospital and the Royal Victorian Eye and Ear Hospital for post-graduate E.N.T. training, and a series of senior E.N.T. Surgeons from Melbourne came to Singapore as Acting Head of E.N.T. Unit, each for six weeks. Mr. George Swinburne, Senior E.N.T. Surgeon to Royal Melbourne Hospital commenced the scheme in August 1964, and was followed by Mr. D. F. Cossar, and Mr. L. J. Caust and Mr. Rory Willis. The scheme will continue into 1965 with the arrival of Mr. John Thomson and Mr. George Gray.

A very high standard of work has therefore been possible in the unit and the E.N.T. Registrars have all benefited greatly by the specialized instructions available. Micro-surgery of the ear in particular has received close attention during the year, and practice on post-mortem material was instituted.

#### *Lectures to General Practitioners*

(a) The Singapore Medical Association members received a lecture from each of the visiting Melbourne E.N.T. Specialists.

(b) The Faculty of Medicine, Committee on Post-Graduate Medical Studies arranged a series of eight courses of instruction to General Practitioners beginning with Course *A* taken by Mr. Swinburne in September 1964 and ending with Course *H* taken by Mr. Willis in December 1964.

#### *Research Project*

(a) "Rhinosporidiosis in Singapore" — This particular problem is discussed, its symptomatology and pathology is described, and the treatment is outlined in a paper produced by Dr. Kikuchi and Dr. Teoh of this Unit.

(b) "The Management of Caustic Soda Burns of the Oesophagus" is being intensively studied at the moment in an attempt to minimise the very disabling strictures that so commonly follow. Dr. Kunaratnam of this Unit is co-ordinating this study, which will continue during 1965.

#### Patients Treated 1964:

Inpatient		1963	1964
Day Patients (lodgers)	...	701	696
Outpatient — New cases	...	8,328	7,622
Repeat	...	18,943	18,252
Operations — Major	...	1,412	1,223
Minor	...	3,145	2,670
Emergencies	...	172	211
Injections	...	3,160	2,653
Dressings	...	1,862	2,036

#### PÆDIATRIC UNIT (WEST)

This Unit is the University Department of Pædiatrics is responsible for the running of the West Wing of the Mistri Block which comprises of four wards providing accommodation for 141 beds.

The Professor with an Assistant Lecturer is responsible for the running of the Neonatal Unit at the Maternity Hospital,



All very ill newborns are transferred to the Department in Mistri Wing so that the Department has to deal with quite a large load of extremely ill newborns.

*Staff.*—The Senior staff consists of: one Professor who is Head of the Department, one Senior Lecturer, two Lecturers, one Assistant Lecturer.

The above is the full complement of the University Staff Department. The Senior Lecturer has been away on study leave for three months during the year and will not be back till March 1965. One of the Lecturers is also attached to the newly created Cardiovascular Laboratory in General Hospital.

*Outpatient Clinics.*—The number of new and repeat outpatients seen in the Clinics were as follows:

		1963	1964
New Cases	...	4,047	4,904
Repeats	...	18,662	16,202

*Admissions.*—As with previous years, the largest number of patients were those with gastro-enteritis, upper respiratory tract infections and pneumonias.

*Mortality.*—The total number of deaths was 280, giving a mortality rate of 4.4 per cent, approximately the same as in 1963.

The major causes of death are: Pneumonia, Congenital heart disease, Kernicterus, Gastro-enteritis.

Pneumonia and gastro-enteritis mortality rates can only be reduced if parents can be induced to bring their infants earlier to hospital for treatment as many of the patients are brought into hospital in a moribund state.

There were 29 kernicterus deaths compared with 34 in 1963 but efforts are still being made to reduce this even further by genetic studies so that families at risk can be warned before-hand to bring their future newborn infants to the paediatrician the moment they are born so that they can be observed daily for possible exchange transfusion, and that parents also warned not to give these babies drugs both traditional and Western unless seen by a doctor. At present a simple rapid method for erythrocytic G6PD estimation is being evolved so that all newborns in K.K.H. are screened and deficient babies are kept back for observation for one week. Furthermore, such families at risk receive a letter which parents are to hand over to the obstetrician warning them of the risk the newborn may encounter and refer such infants to the paediatrician. It is to be hoped that as a result of such research the incidence of kernicterus may be further reduced. Kernicterus is again the main cause of death in infants under one week of age admitted to the Unit.

Congenital heart disease again claims a large proportion of infants. The establishment of open heart surgery in the Hospital will definitely salvage some of these infants.



There was an outbreak of Viral Hæmorrhagic Fever in 1964. There were eight deaths out of 80 cases, i.e. a mortality rate of 10 per cent. In collaboration with the Department of Bacteriology, University of Singapore, the patients who died had autopsy and serological results typical of hæmorrhagic fever. Therefore, this disease which was reported previously in Singapore as not causing any mortality in children is erroneous.

*Research.*—The Department is involved in the following research projects:

- (1) Neonatal hyperbilirubinæmia and kernicterus. It has been found that the causes of kernicterus in Singapore are different from those in other Western countries and that erythrocytic glucose-6-phosphatase deficiency and liver immaturity are the commonest causes. The type of food and drugs taken by the breast-feeding mother and given to the newborn are being studied with a view to elucidating the “triggers” for such hyperbilirubinæmia. It has also been shown by the Department that nearly 100 per cent of our local newborns are jaundiced in the first week of life and that serum bilirubin levels are high and last a longer time than their Western counterparts. The American Research Worker is still working in the Department.
- (2) The pathology and management of hyaline membrane disease with surface-acting inhalants and intravenous electrolyte solutions. A team of seven American research workers were in the Department for a period of about six months working on the project.
- (3) The work on mental deficiency, its causes and management, continue and the Department is closely associated with the Association for the Mentally Retarded in the training of such patients.
- (4) Work on chromosomal abnormalities continues.
- (5) Genetic counselling is now provided for parents of children with genetic diseases as a result of research on genetic problems in this country.
- (6) Relationship of Hb.H.Thalassæmia and Hb. Bart’s and a new genetic theory is advanced from the Department.
- (7) The management of Hb.H.Thalassæmia in pregnancy.
- (8) The work on the obstructive jaundice syndrome in infancy continues.
- (9) Xg linkage studies in Chinese in Singapore.
- (10) Congenital heart disease in Singapore.
- (11) Severe type of hæmorrhagic fever and its management.

*Laboratory Staff.*—The Laboratory is a research laboratory which has developed techniques in the study of various diseases in pædiatrics including human genetics. The Staff consists of a trained laboratory technician and two laboratory technicians in training. As a result of the special investigations carried out by the Research Laboratory, a “routine” service is also provided for other Units in General Hospital, K.K. Hospital, Tan Tock Seng Hospital, Thomson Road Hospital as well as hospitals in Sabah, Sarawak and Johore Bahru. The trained Laboratory technician has been away for three months in 1964 and will be away for another three months in 1965 in U.K. on a University Scholarship to study further techniques in pædiatrics and genetic research.

The type and number of “routine” investigations carried out include following (Table 77):

Table 77

## ROUTINE SPECIAL LAB. INVESTIGATIONS

Tests	No. in 1963	No. in 1964
Micro blood sugar	... 503	542
Micro serum bilirubin	... 773	1,477
Alkali resistance of Hb.	... 993	1,021
Erythrocytic glucose-6-phosphate dehydrogenase	963	982
Hb. electrophoresis (paper)	... 983	1,011
Hb. electrophoresis (starch)	... Nil	239
Hb. H. inclusion bodies	... 843	897
Buccal sexing	... 366	57
Chromosome culture	... Nil	73

It will be seen that the work has generally increased and that starch electrophoresis and chromosome culture have also been offered as a “routine” service.

## PÆDIATRIC UNIT (EAST)

The Unit is the Government Pædiatric Department which has four wards with a bed complement of 141. One of the four wards is the admission ward with 21 beds.

*Staff.*—The senior medical staff was reduced to three when the head of the Unit resigned in October.

*Outpatient Clinics.*—The attendances at the Unit’s outpatient department remained large. The large numbers at the Unit’s outpatients department was because of rapid turnover and patients were discharged who were not completely recovered from their illness.

The striking difference between the 1963 and 1964 figures was the significant increase in the referral cases: 1,057 in 1963 to 2,531 in 1964.

The number of new outpatients was 3,608 and re-attendances 15,366.

*Admissions.*—The admission rate continued to be high this year for the limited number of pædiatric beds. Although comparing with 1963’s figures, it showed a slight drop from 6,576 to 5,481, yet the latter figure still showed an average admission rate of 30 patients per admission day.



The disturbing factor was the high re-admission rate which accounted for 1,803 cases out of 5,468, i.e. about 33 per cent of total admission.

Gastrøenteritis again topped the list as the commonest cause of admission. The mortality rate of this disease had also dropped.

The incidence of Miliary Tuberculosis and Tuberculosis Meningitis had dropped since the introduction of mass B.C.G. inoculations. But unfortunately they were still present and carried a high mortality and morbidity rate. Although many of the children suffering from these two diseases did not receive B.C.G. at birth, yet there were a few cases who had been B.C.G. and yet they contacted these diseases in the severe form.

There was epidemic of Hæmorrhagic Fever in Singapore with quite a number of cases admitted in shock. Since this disease and that of encephalitis are caused by viruses which are transmitted by mosquito bites and there are no curative measures against them, the solution would be adequate control of mosquitoes in the island.

Acute leukæmia again headed the list in malignancies in infant and childhood. The effect of I.V. Methotrexate on the survival rate of affected children was under study. One child had survived for more than two years on this drug. Most other cases perished in six months to one year.

Congenital heart disease headed the list of congenital abnormalities.

The percentage mortality against admission had dropped again this year from 4.36 per cent in 1963 to 4.08 per cent in 1964. The shortage of senior medical staff and experienced medical officers in the Unit would be factors working against the maintenance or improvement of standard in the Unit.

#### ADMISSIONS, DISCHARGES AND DEATHS EACH MONTH OF 1964

		ADMISSION			DISCHARGE	DEATHS	
		New	Re-attendance	Total	Total	Under 24 hrs.	
January	...	360	179	539	528	17	4
February	...	227	107	334	345	16	6
March	...	378	146	524	480	15	8
April	...	348	186	534	498	19	13
May	...	420	187	607	591	29	12
June	...	301	148	449	412	24	12
July	...	288	152	440	458	14	6
August	...	247	139	386	363	22	12
September	...	228	146	374	335	23	8
October	...	295	155	450	410	12	6
November	...	295	152	447	431	12	7
December	...	278	106	384	371	21	6
Total	...	3,665	1,803	5,468	5,222	224	100

Total admissions:	...	5,468
Transfer to other Units:	...	506
		4,962
Transfer from other Units:	...	519
Total cases:	...	5,481
Percentage mortality:	4.08%	



*Research.*—The following is a list of research projects undertaken in the Unit:

1. The Study of Hæmorrhagic Fever with regards to
  - (a) Level of Serum Isocitric Dehydrogenase Enzyme — relationship to liver function.
  - (b) Level of Serum  $\alpha$  Hydroxybutyric Dehydrogenase — relationship to heart muscle.
2. The Response of Cerebral Palsied Children to Valium in relationship to:
  - (a) Emotional stability;
  - (b) Improved performance;
  - (c) Relaxation of spastic muscles.
3. The Study of Methæmoglobinæmia in Infancy:
  - (a) The reason for the high incidence among
    - (i) infants below the age of two months;
    - (ii) infants suffering from gastroenteritis;
  - (b) Level of methæmoglobin reductase in infants of various age groups.
4. The incidence of Tuberculosis particularly Miliary Tuberculosis and Tuberculosis Meningitis among
  - (a) patients who had B.C.G.;
  - (b) patients without B.C.G.
5. To Study the Effect of Intravenous Methotraxate on cases of Acute Leukæmia in children from the point of view of:
  - (a) remission where other forms of therapy have failed and the length of such remission;
  - (b) survival rate.
6. To Study the Causes of Jaundice in the Newborn in the first two weeks of life with special reference to enzyme deficiencies.
7. To Study the cases of Cretinism with regards to physical and mental development.
8. The long term study of congenital Heart Disease and Rheumatic Heart Disease.
9. Study of Obstructive Jaundice in Infants:
  - (a) Aetiology, from clinical, biochemical and histological data;
  - (b) Response of disease to corticosteroid.

*Laboratory.*—There were three laboratory technicians attached to the Pædiatric Unit (East) Laboratory. They served both the East and West Units and had so far did a very good job. The volume of work had again increased as can be seen on the figures provided below. The epidemic of Hæmorrhagic Fever last year probably was responsible for some of the increase.

EXAMINATIONS DONE IN THE PÆDIATRIC (EAST) LABORATORY

		1963	1964
Blood :			
Physiological	...	36,027	38,409
Micro B.S.R.	...	2,737	3,354
Urine	...	4,799	6,018
Stool	...	378	474
Cerebral spinal fluid	...	65	403
Smears and scrapings	...	135	87
Total	...	43,841	48,745

ANÆSTHETIC UNIT

*Staff.*—The staff consisted of 12 full-time Anæsthetists, two part-time Anæsthetists.

*Activities.*—Unit Meetings were held every Saturday morning. Administrative problems, morbidity and mortality discussions are the majority considerations. Anæsthetic films and guest lecturers were occasionally given.

Dr. Ganendran continues to manage the majority of cases of severe Tetanus in the hospital.

Resuscitation and management of poisonings and respiratory difficiencies were undertaken in the various Wards of the General Hospital whenever the requests were made.

Trial runs of ‘open heart’ surgery — using dogs as patients were undertaken by Dr. A. Ganendran and E. O. Goonetilleke during the year whenever freedom from routine anæsthetists permitted. Good progress was made and this type of surgery poised for introduction to the human patient.

ANALYSIS OF ANÆSTHETICS ADMINISTERED IN 1964

The following is an analysis of the anæsthetics administered for the year :

Unit	General	Spinal	Epidural	Caudal	Local	Total
“A” Theatre	3,326	704	18	283	2,852	7,183
“B” Theatre	2,921	478	14	111	3,000	6,524
“C” Theatre	2,557	67	—	30	4,461	7,115
E.N.T.	889	—	—	—	2,503	3,392
Eye	443	—	—	—	—	443
Dental	4,964	—	—	—	—	4,964
X-Ray	64	—	—	—	—	64
K.K. Hospital	3,919	113	10	314	1,293	5,649

PHYSIOTHERAPY DEPARTMENT

1964 started off badly with the number of staff at its lowest. However, the staff situation improved gradually from March with the return of all the four scholarship trainees and the appointment of four temporary officers.

The present Physiotherapy Establishment is as follows :

In General Hospital :		
Senior Physiotherapist	...	1
Physiotherapists	...	14
Tan Tock Seng Hospital	...	3
Thomson Road Hospital	...	1
Chronic Sick Hospital	...	1
Total: 1 senior post		
19 physiotherapy posts.		



The improved staff situation enabled more expansion of Physiotherapy Services both within General Hospital and outside:

Physiotherapy Service to St. Andrew's Orthopædic Hospital was increased from two to three days a week (full day).

Physiotherapy Service was started in the Chronic Sick Hospital in May 1964 beginning with two mornings a week and progressed to three mornings a week.

Physiotherapy Service resumed again at the Trafalgar Home from May 1964 after a break in late 1963. A physiotherapist visits the Home two afternoons a week.

Number of persons treated was as follows:

All Hospitals		1962	1963	1964
New Cases	...	8,850	10,111	11,771
Repetitions	...	119,999	116,157	120,816
General Hospital only				
New Cases	...	—	6,904	7,418
Repetitions	...	—	78,143	80,710

In spite of the two civil disturbances which prevented many outpatients turning up for treatment, there is an increased number of New Cases and Repetitions over the previous years.

Two Physiotherapy Aids were sent from Trafalgar Home for six months to observe Physiotherapy work in General Hospital applicable to cases dealt with in Trafalgar Home. They are now working in Trafalgar Home under the supervision of a physiotherapist from General Hospital.

The Gymnasium in Ward 62 was closed in December 1964 and all cases treated there are being done in the Physiotherapy Department. The change over was carried out smoothly without any trouble at all.

## OCCUPATIONAL THERAPY DEPARTMENT

### *Activities*

Visits to long-term patients in Kandang Kerbau Hospital were stopped since March as patients were not always present when the Occupational Therapist from the General Hospital paid her weekly visit.

The staff on one of their visits to the St. Andrew's Orthopædic hospital organised a picnic at a bungalow in Tanah Merah for 15 children, and with the help of the hospital staff, packed lunches were brought along and an enjoyable time was had by the children.

At the Spastic Centre, regular visits were made by staff and the standard of articles done by the children has improved to such an extent that one of the articles, a plastic seated stool, displayed in the Combined Social Services Exhibition and Sale of Works at the Victoria Memorial Hall, won first prize. This stool was later bought for \$100.

The annual sale was held as usual on 1st November. About \$1,279.60 was collected.



In early December, a scheme for training of the disabled was introduced in the Hospital and Trafalgar Home. Now for these disabled patients of the hospitals are supported by the Ministry of Labour on a \$50 monthly allowance to be instructed in certain crafts for a period of 6-9 months. The Occupational Therapists also test these trainees for work-tolerance, initiative, educational capabilities, neatness, for future employment in factories or firms.

The average number of patients treated by staff at General Hospital is 300.

SUMMARY OF WORK

	New Cases	Repeats
General Hospital	984	19,717
S.A.O.H.	78	2,208
Spastic Children Centre	4	1,404
Thomson Road Hospital	358	7,840
Tan Tock Seng Hospital	491	23,489
Woodbridge Hospital (Female)	279	30,282
Woodbridge Hospital (Male)	208	30,449
Trafalgar Home	98	33,177
Chronic Sick Hospital	20	1,472

CASH FROM SALES OF ARTICLES

	\$	c.
General Hospital	4,639	90
Thomson Road Hospital	1,667	05
Tan Tock Seng Hospital	5,542	20
Woodbridge Hospital (Female)	2,557	40
Woodbridge Hospital (Male)	458	65
	3,631	20
Chronic Sick Hospital	168	60
Trafalgar Home	5,241	40

ALMONER'S DEPARTMENT

Staff

*Acute Shortage of Staff.*—There has been shortage of Almoners not only in General Hospital, but in the Service as a whole.

If the situation is not changed in the next year, it may be necessary to contract down the service and to use the remaining Almoners in a few hospitals to provide a service of food standard, leaving some hospitals without any Almoners at all.

*Liaison with Voluntary Organisations*

*Cheshire Home.*—The Almoner of the Chronic Sick Hospital is on the Cheshire Homes Admission Committee and through her offices was able to admit eight patients to Cheshire Home from General Hospital.

*Blind Association.*—The Almoner in the Ophthalmic Unit has worked in close co-operation with the Welfare Officer of the Blind Association and jointly they arranged for seventeen patients to be admitted to Woodlands Temple.

*The Deaf Association.*—The Almoner of the Ear, Nose and Throat Unit is a member of the Executive Committee as well as on the Case Committee and has been able to send suitable children for training, assist with purchase of hearing aids.

*Spastic Association.*—The Spastic Register is kept by the Almoner, Pædiatric Unit and she is a member of the Executive Committee as well as the Case Committee and works in close liaison with the Matron of the Day Centre for spastics.

*Singapore Children's Society.*—The Pædiatric Unit Almoner is a member of the Convalescent Home Committee and works in close liaison with the Hon. Medical Officer and the Matron, so that suitable children are sent to the Convalescent Home from the Pædiatric Unit.

*Singapore Association for Retarded Children.*—The Senior Almoner is a member of the Ah Hood Road Centre Committee, as well as the Outram Road Day Care Centre Committee and works in close liaison with these Committees so that mentally retarded children from General Hospital can use all the facilities that are available for them in Singapore.

*Society for Aid to the Paralysed.*—The Senior Almoner is a member of the Executive Committee of this newly formed Society and is at present responsible for a Register of such patients, as most of the patients are known to Almoners in various hospitals.

### *Problems*

(a) *The Chronic Sick.*—This is the most acute problem that the Almoners have to deal with, and they have had to device various *ad hoc* programmes to deal with it.

There are at present 23 patients in 319H Aljunied Road and 20 patients in 218F Aljunied Road.

Both are private Homes 'run' by caretakers and the Almoners are responsible for payment for the patients' keep, as well as for their welfare. The district nurse attends regularly. Those whose condition deteriorates are admitted to the chronic wards when a bed is available, and a patient who is ambulant may be discharged from the chronic wards to these Homes.

*Woodlands Temple.*—In 1964, 46 patients were admitted to Woodlands Temple from General Hospital. Members of Hoc 'H' have been most helpful in providing blankets and other comforts for these patients. They also collect and distribute rations from the Catholic Welfare Services to patients in this Temple. Patients not on Social Welfare Relief are helped with their keep in Woodlands Temple from the various Funds available in General Hospital.

(b) *Mentally Retarded Children.*—This problem is still an acute one although the pressure is not as great as it used to be. The Social Welfare Department gave a grant of \$28,800 to be used for fostering of mentally retarded children, as well as to maintain mentally retarded children in their own homes.



In 1964 22 M.D. children were fostered out, 2 M.D. children were admitted to the mental defective wards and 93 M.D. children were assisted with family grants. A total of \$28,053 was spent for fostering and maintenance.

### *Funds*

(a) *Public Assistance Fares*.—\$30,000 was spent on fares for patients who are on Public Assistance so that they could attend for treatment at General Hospital as well as at Jalan Teck Whye, Pegu Road, Kallang, Paya Lebar and Maxwell Road Outpatient Dispensaries.

(b) *Government Welfare Vote Fund*.—\$10,100 was spent on fares for patients not on Public Assistance but who required assistance to attend at General Hospital or the Outpatient Dispensaries.

(c) *M.D. Vote*.—A total vote of \$28,800 was approved for payment of foster mothers of mental defective children as well as for family grants.

\$10,320 was spent on fostering and \$17,733 was spent on family grants.

(d) *James Craig Trust Fund*.—\$9,441.80 was spent on the “care, maintenance and support of patients”. The greater part of this Fund was used to maintain patients at the various ‘Temples’ and ‘Homes’.

(e) *Appliance Fund*.—The Almoner, Orthopædic Unit uses this Fund to supply free appliances to patients on Social Welfare Relief and part payment for those who are unable to meet the total cost.

(f) *Almoner’s Samaritan Fund*.—The Fund is used to meet any contingency for which no Government Funds are available. The largest donation to this Fund was \$1,000 which was made by Dato Lee Kong Chian.

## DIETETIC DEPARTMENT

All six posts for Dietitians at the various Hospitals were filled by August 1964, and the appointment of a second Steward at General Hospital left only one vacancy for an assistant Steward at Middleton Hospital among the posts for Stewards.

The average daily number of diets and their costs are shown below:

		Average No.	Average cost
(i) Paying <i>A</i> (1st)	...	41	\$3.17
(ii) Paying <i>B</i> (2nd)	...	98	\$2.46
(iii) Free (Adult)	...	662	\$1.12
(iv) Free (Children)	...	205	.95

## MEDICAL RECORDS DEPARTMENT

*Accommodation for a Central Records Registry*.—The present building which is on lease from the University of Singapore is inadequate as a result of which the old case notes for period 1946 to 1954 had to be temporarily stored at the Maxwell Road Outpatient Dispensing building.



*I.C.T. 80 Column Punch Card Equipment.*—I.C.T. punch card machines (a hand punch, an electrically operated verifier and a Sorter Counter) were acquired on rental basis for the analysis of admission — discharge data, T.B. Control and medical research work. In the following years, with the availability of full time operators and the implementation of the Medical Records Service it is hoped to undertake analysis of data from all hospitals.

*Research.*—This office supplied information and statistical data to medical consultants of both the University and Government Units of the hospital for research purposes on the following diseases: Carcinoma of the Liver, Thyroid, Tetanus, infective Hepatitis, Amœbic Hepatitis, Tuberculosis Liver, Liver Abscess, Choletithiasis, Polycystic Liver Hydatid Cyst of Liver, Rheumatic Diseases, Chorea, Endocarditis, Myocarditis, accidents — Poisonings and Violence, Leukæmia, Diverticulitis, Carcinoma Colon, Carcinoma Rectum, Ulcerative Colitis, Crohn's Disease (Regional Ileitis), Structure of Oesophagus due to caustic soda poisonings, Lymphosarcoma and Reticulosarcoma, Hodgkin's Disease, Malignant and Non-malignant Tumours and Dysentery (All forms).

*Medical Reports Section.*—This section of the Central Records Office dealt with approximately 4,034 medico-legal reports in 1964, in addition to 2,733 workmen compensation reports.

*Medical Records Forms.*—A number of forms were revised and new forms introduced during the year.

## DENTAL CLINIC

The Dental Clinic, General Hospital, functions as a teaching School for the University of Singapore, a specialist unit and an Outpatient Clinic for adults and children.

### *Staff*

The staff consists of two professors, two senior lecturers, eight lecturers and two assistant lecturers in dentistry; a senior dental surgeon and three dental surgeons.

### *General*

Table 78 sets out the details of treatments carried out during the year 1964 and for the last 14 years. Table 79 gives the cases on an ethnic basis.

The total outpatient attendances for 1964 have since last year decreased by 14,350 to a total of 113,850 with a daily average of 379.64. The majority of cases received emergency treatment and the number of extractions has fallen further to 39,252. The number of dressings was reduced to 25,184 and less significant, was a decrease in Oral Surgery operations to 1,727. The institution of four general anæsthetic sessions weekly has allowed for the treatment of 4,869 children and extraction of 22,462 teeth, increases of 9.9 per cent and 24.3 per cent respectively over the figure for 1963. There being

57 students in the clinical years, the work in Conservative Dentistry shows an increase to 7,979, 3.1 per cent over the 1963 figures. The number of dentures provided has increased even further to 3,471 and it is heartening to note an increase in the number of partial dentures supplied. This indicates an increasing awareness of the need to conserve teeth.

A decrease in the number of daily attendances has been noted for February (due to the Chinese festive season and the Muslim fasting month) and for July, August and September. The falls during the latter months were due to the unsettled conditions following the riots and to some extent, the closure of the General Hospital's Outpatient Department.

During the disturbances in July a number of casualties required treatment by the Oral Surgery Unit but the number diminished in the September riots. A plan for mobilization of the Dental Services in future cases of emergency has been adopted.

The acute shortage of space has not been relieved. Although there is some liaison between surgical units of the General Hospital and the Oral Surgery unit, it would be of tremendous advantage if some beds may be allocated for oral surgical cases. At present both local and general anæsthetic cases are treated in the same operating theatre. This, together with the dental unit now forming a part of *E* Casualty Unit in the General Hospital will obtain recognition of the Hospital as a training unit for the Fellowship in Dental Surgery of the Royal Colleges of Surgeons.

### *Revenue*

This has increased by \$1,239 from \$39,305 to \$40,544. A request that payment stamps be available for the collection of small payments is repeated to increase efficiency of the clerks/interpreters in the Admissions office.



Table 78

Year		Total New Cases	Total Out- patients Attend- ances	Daily Average	Extrac- tions	Oral Surgery Operations	Fillings	Dres- sings	Dentures	X-Rays	Revenue  \$ c.
1951	..	7,149	29,168	106.06	22,973	..	3,490	12,556	1,457	3,571	29,125 65
1952	..	10,054	37,988	138.11	27,933	..	5,913	10,223	1,223	4,498	31,126 67
1953	..	14,444	50,449	183.42	51,972	..	6,006	31,604	1,726	6,298	44,535 59
1954	..	21,525	63,469	231.20	71,715	..	6,859	44,641	2,092	6,596	53,842 84
1955	..	27,895	82,107	278.74	83,392	847	6,039	52,201	1,873	6,761	34,738 85
1956	..	32,547	99,004	334.47	82,175	898	6,741	63,338	2,348	9,137	36,341 94
1957	..	36,508	107,700	362.05	67,785	646	9,048	64,018	2,304	10,683	32,068 65
1958	..	25,770	87,293	291.03	53,701	755	5,277	23,315	2,025	15,498	21,954 50
1959	..	33,958	101,754	340.1	61,826	887	7,660	20,314	1,638	16,610	22,368 10
1960	..	42,948	112,211	375.87	83,259	978	7,165	18,855	1,809	17,696	25,077 25
1961	..	39,242	110,687	370.66	56,062	1,131	10,875	16,787	2,247	13,103	29,849 75
1962	..	40,082	115,838	390.03	59,144	1,438	7,251	24,982	2,941	14,205	35,034 10
1963	..	38,726	128,200	429.46	56,234	1,770	7,738	27,198	3,105	13,861	39,305 00
1964	..	33,194	113,850	379.64	39,252	1,727	7,979	25,184	3,471	15,677	40,544 00



Table 79  
DENTAL CLINIC, GENERAL HOSPITAL  
OUTPATIENTS—BY ETHNIC GROUPS

Nationalities	NEW CASES				RE-ATTENDANCES			
	Male	Female	Child- ren	Total	Male	Female	Child- ren	Total
Malays and Other Malaysians ..	1,709	995	861	3,565	2,707	2,084	1,088	5,879
Chinese .. ..	8,538	9,007	9,322	26,867	21,077	31,829	14,746	67,652
Indians, Pakistanis and Cey- lonese .. ..	1,564	625	537	2,726	4,054	1,863	960	6,877
Others .. ..	23	7	6	36	145	86	17	248
Total ..	11,834	10,634	10,726	33,194	27,983	35,862	16,811	80,656
Number of Dressings		..	..	..	25,184			
Number of Injections		..	..	..	10,047			

## 17. THOMSON ROAD GENERAL HOSPITAL

THE Hospital was completed in 1958 and consists of two ward blocks each of six floors providing accommodation for 396 beds. The staffed wards during the year were five in number having accommodation for 180 beds and were used exclusively for adult medical cases.

The Hospital was originally planned as a Hospital for the Chronic Sick. However, it will become a fully operational general hospital when the new extensions are completed. The extensions will provide for outpatient facilities, a surgical block and an X-ray Department. The extensions were completed in June and the following departments moved in in October: the Medical Records Office, the Follow-up Clinic, X-ray Department and Dispensary.

The Medical Superintendent of the Hospital was Dr. Seah Cheng Siang, who was also the Physician to the Medical Unit. On 1st September, 1964, Dr. H. F. Jackson was appointed as Medical Superintendent, thereby releasing Dr. Seah Cheng Siang to full-time duties as Physician to the Hospital.

Two Medical Officers of Senior Registrar grade formed the other senior medical staff of the Unit.

Construction of a new Nursing School for assistant nurses began in December 1964. In the meantime, assistant nurses continued to be trained in a vacant ward in the Hospital. 149 assistant nurses completed their training in the School during the year.

### INPATIENTS

Until the Hospital has its own admitting unit patients for admission were made through the General Hospital and from the nearby outpatient dispensaries. Admissions through the General Hospital are made during two days out of every three days, and are accepted during the hours of 8 a.m. to 4 p.m. on the admitting days. Admissions are also made at any time for those patients who are referred to the Hospital from the nearby outpatient dispensaries.

A record of the patients in the year is as follows:

Staffed Beds	...	180
Number of admissions	...	4,161
Number of discharges	...	3,795
Number of deaths	...	322
Average daily bed occupancy	...	144
Patient days	...	52,704
Percentage of deaths to total discharges and deaths	...	7.8%

### OUTPATIENTS CLINIC

This was conducted daily to (a) treat discharged patients; (b) assess and investigate patients referred by doctors both in Government service and in general practice. In addition, this clinic was responsible for the care of sick staff and their families,



The following table gives a racial and sex breakdown of both groups of patients :

TABLE 80

Nationalities	NEW CASES				RE-ATTENDANCES			
	Male	Fe- male	Child- ren*	Total	Male	Fe- male	Child- ren*	Total
Malays and Other Malaysians	41	36	10	87	699	553	310	1,562
Chinese .. ..	351	385	38	774	6,114	6,320	507	12,941
Indians, Pakistanis and Cey- lonese .. ..	133	64	15	212	1,785	861	241	2,887
Others .. ..	13	17	4	34	167	208	23	398
Total ..	538	502	67	1,107	8,765	7,942	1,081	17,788

\*Under 12 years of age.

## 18. KANDANG KERBAU HOSPITAL (MATERNITY AND GYNAECOLOGY)

THE Kandang Kerbau Hospital is the only Government institution which provides for a maternity and gynæcology service in the State.

### CLINICAL ADMINISTRATION

The bed-strength of the hospital was 443 and made-up as follows:

Obstetric beds — 314; 12 of these are set aside for isolation of “septic”, cases.

Gynæcological beds — 129.

There are 100 nursery beds or “cots” of which 42 are set aside for the Premature Baby Unit, but these are not included in the bed complement of the hospital as a separate admission procedure is not adopted for the babies placed in them. These babies are usually born of mothers delivered in the hospital.

There are 10 “recovery” beds attached to the gynæcological minor surgical theatre. These beds are also not included in the official bed complement.

The hospital is organised into three units: the Government *A* and *B* Units and the University Training Unit. The distribution of beds is as follows:

			OBSTETRICS		GYNÆCOLOGY	
			Wards	Beds	Wards	Beds
University Training Unit	...		7 & 8	52	17	27
Government Unit ‘A’	...		3 & 4	48	16 & 18	42
Government Unit ‘B’	...		1 & 2	48	15 & 18	46
<i>B</i> Class Wards	...		11	28	20	8
<i>A</i> Class Wards	...		19	12	20	6
Maternity Home Unit	...		5 & 6	126		

The Government *A* and *B* Units are headed by Mr. T. H. Lean, M.B., F.R.C.S.(G), F.R.A.C.S., F.R.C.O.G. and Dr. S. M. Goon, M.B., M.R.C.O.G. respectively and are also responsible for the consultant cover of the fourth unit within the hospital viz: the Maternity Home Unit which technically is run by the Nursing and Midwifery Staff of the hospital and which was responsible for the bulk of the normal deliveries within the hospital. This bulk constituted about 65 per cent of the total hospital deliveries in the year under review.

*Staff.*—The medical staff consisted of two consultants, two Senior Registrars and an average of 15 Medical Officers. There were many resignations of doctors during the year and the position of medical staff has always been acute due to the fact that the 22 posts on the establishment could not be filled for obvious reasons.



*Committees.*—The Post-graduate Committee was responsible for the organising of clinical conferences, peri-natal and maternal mortality reviews, courses of post-graduate lectures, clinical symposia and panel discussions. This Committee was also to be responsible for research programmes in the hospital and the maintenance of the hospital medical library.

The Cancer Committee was responsible for all patients with female genital cancer seen in the hospital, and the maintenance of a Female Genital Cancer Registry. The social aspects of such cases had not been overlooked for the Almoner of the hospital was a member of this committee. The satisfying aspect of the work of this committee is the fine liaison between the Gynæcologists of the hospital and the Radiotherapist.

Two other committees which assisted in the clinical management of the hospital were the Surgical Supplies Committee and the Drugs Advisory Committee.

#### INPATIENTS

*Admissions.*—(a) The total number of admissions for the year was 50,876 of which 44,108 were maternity and 6,768 were gynæcological as against 50,483 for last year of which 44,329 were maternity and 6,154 were gynæcological.

(b) The average daily number of patients was 444.

*Maternity.*—(a) The number of admissions for the year was 44,108 and the deliveries were 39,598 as against 44,329 with 39,436 for last year.

(b) The maternal deaths were 24 or 0.5 per thousand as compared with 0.6 per thousand last year.

*Gynæcological.*—(a) There were 6,768 admissions as against 6,154 for 1963.

(b) The number of deaths was 40 as against 45 for the previous year.

(c) There were 11,523 operations performed of which 6,336 were on inpatients and 5,187 were on outpatients.

(d) The operations performed were chiefly Cæsareans, hysterectomies, colporrhaphies, dilatation and curettage, cautery of cervix, myomectomies and sterilization.

#### OUTPATIENTS

*Ante-natal and Gynæcological Outpatients' Departments.*—(a) The total number of attendances was 105,674 of which 72,860 were ante-natal and 32,814 gynæcological.

(b) Of the 105,674, 31,530 were new cases and 74,144 repetitions.

(c) Special clinics were held in the afternoons, during week days.

*Post-natal Clinic.*—The number of mothers who attended the clinic was 19,718 and babies 18,329 as against 25,801 and 23,094 for 1963 respectively.

## PREMATURE BABY UNIT

The staff comprised the Professor of Pædiatrics, and an Assistant Lecturer in Pædiatrics. There has therefore been a reduction of one compared to the previous year. This medical staff of two is responsible for the following wards:

- (a) Premature Nurseries one and two;
- (b) Lying-in Wards one and two, three and four, five and six, seven, eleven and nineteen.

The medical staff also sees newborns referred for consultation in the post-natal clinic every morning and in addition runs a follow-up medical out-patients clinic on two afternoons a week.

An American team of doctors and science personnel was attached to the Department under the International Co-operation for Medical Research Training from the Hooper Foundation at the Medical Centre in San Francisco, to carry out observations on pulmonary hyaline disease in newborns and also to assess the efficacy of a surface active substance in the treatment of the disease. The scheme was of great benefit to both the team and the local staff, and preliminary results show that the mortality rate from the disease was reduced during the period when this therapeutic substance was used. The Head would like to express his deep appreciation of the ready assistance from the Ministry of Health in this project. The team has now left and has presented the Hospital with four incubators.

## THE DOMICILIARY DELIVERY SERVICE

As usual this service continued the training of medical students, general trained nurses and pupil midwives in the domiciliary field. The service was supervised by a Sister assisted by three staff nurses midwives and 30 trained midwives.

A total of 1,500 cases in labour were attended, of which 86 cases were transferred to hospital due to foetal or maternal reasons and 1,414 cases were delivered in their homes. Puerperal visits paid by staff to patient in their homes were 11,481, including ante-natal and assessment visits.

## THE DOMICILIARY AFTER-CARE SERVICE

The After-care Service looked after mothers and babies discharged from hospital without 36 hours of delivery in the homes. During the year 10,009 cases were carried for and the number of visits paid by the staff were 68,993.

## EVENTS DURING THE YEAR

Certain events need to be recorded.

On the re-organisation of the Outpatient Services the Outpatient Dispensary for women and children which occupied an out-building was closed on 1st August, 1964. The building has since been put to use for a post-natal clinic, the Family Planning Unit and the Cytology (Cancer Screening) Laboratory.



A start has been made to provide a cytological service for the hospital. A doctor has been sent for post-graduate training in the United States.

The unfortunate racial riots of July and September placed a heavy strains on the hospital and those of its staff who man it during the curfews. Although the hospital was not receiving casualties it had to continue to deal with an increased number of births. Mothers were brought in by police vans and by the fire-brigade ambulances (which normally deal with accidents).

Charges were made for deliveries undertaken in 'C' Class wards where these were performed free of charge previously. The charges were at the rate of \$10 for Singapore citizens and \$50 for non-Singapore citizens. It is too early to predict the effect of these charges on the numbers of deliveries which will be undertaken by the hospital in the future.

## 19. MIDDLETON HOSPITAL (INFECTIOUS DISEASES)

THE Middleton Hospital is the hospital for the treatment of infectious diseases. It has accommodation for 250 patients. It is one of the oldest of the hospitals in use having been built in 1913. For most of its existence it was under the administration of the former City Council Health Department. In 1960 it was brought into the fold of the Government Medical Services.

The Medical Superintendent was Dr. Leong Kwok Wah, who was confirmed in his appointment on 30th May, 1964. He was assisted by a part-time Medical Officer.

Singapore has been relatively free of the major infectious diseases. The commonly occurring cases admitted to the hospital are the minor infectious diseases such as chicken-pox and measles. The presence of diphtheria, the dysenteries, typhoid fever and the continued outbreaks of cholera are indications of the ever present dangers.

The list of the more important infectious diseases as seen in the hospital in the last 10 years is given in the following table 81.

Table 81

### ADMISSIONS OF THE MORE IMPORTANT INFECTIOUS DISEASES DURING THE LAST 10 YEARS

	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Amœbic										
Dysentery ..	136	126	197	156	112	249	261	285	257	328
Bacillary										
Dysentery ..	17	26	74	60	36	70	96	118	152	144
Chicken-pox ..	1,769	1,488	1,039	472	987	1,453	975	1,249	1,221	701
Clinical										
Dysentery ..	35	65	150	92	68	161	224	219	235	215
Cerebro-spinal										
Meningitis ..	..	..	..	4	..	..	..	1	..	..
Cholera, El Tor	..	..	..	..	..	..	..	..	27	23
Diphtheria ..	460	552	712	547	519	642	587	353	394	204
Erysipelas ..	..	2	3	1	..	3	..	3	..	1
Measles ..	200	301	153	357	146	178	318	403	315	283
Mumps ..	54	52	14	43	47	55	47	42	50	29
Pneumonia ..	..	..	..	1	4	3	1	..	1	1
Plague ..	..	..	..	..	..	..	..	..	..	..
Poliomyelitis ..	19	37	52	405	66	201	48	12	66	12
Rubella ..	..	86	36	7	9	16	5	14	14	21
Scarlet Fever ..	..	..	1	..	..	..	..	..	..	..
Small-pox ..	..	..	..	..	10	..	..	..	..	..
Tropical Typhus	..	1	..	1	..	..	..	..	1	1
Typhoid Fever	114	76	118	127	160	174	155	103	169	120
Whooping Cough	5	85	30	38	15	39	23	37	9	14
Other Diseases/										
Carriers ..	503	936	1,083	1,368	1,272	1,680	1,187	2,097	1,997	1,433
Total ..	3,312	3,851	3,662	3,679	3,451	4,924	3,927	4,936	4,908	3,530



Table 82

NUMBER OF ADMISSIONS, DAYS IN HOSPITAL AND DEATHS  
BY ETHNIC GROUPS

Ethnic Group		Re- main- ing No. of Patients (1963)	No. of Days in Hospital	Admit- ted of Patients	No. of Days in Hospital (1964)	Total No. of Patients	Total No. of Days in Hospital	Deaths
Europeans	..	1	43	4	21	5	64	..
Eurasians	..	1	2	39	319	40	321	..
Chinese	..	91	3,676	2,057	24,332	2,148	28,008	39
Indians/Pakistanis	..	8	38	891	8,508	899	8,546	5
Malay s	..	15	192	483	5,638	498	5,830	7
Javanese	..	1	177	29	361	30	538	..
Others	..	..	..	27	130	27	130	..
Total	..	117	4,128	3,530	39,309	3,647	43,437	51

Table 83

ADMISSIONS, TRANSFERS AND DEATHS BY SEX GROUP

Sex		Remain- ing 1963	Admis- sions 1964	Transfers	Deaths	Remain- ing 1964	Death %
Male	..	57	2,105	20	23	86	1.06%
Female	..	60	1,425	27	28	96	1.88%
Total	..	117	3,530	47	51	182	2.94%

Average daily number of patients = 127  
 Number of Hospital beds = 250

During the year there were 3,530 admissions and a total of 51 died, giving a mortality rate of 1.4 per cent.

Table 84

## ADMISSIONS, DISCHARGES, TRANSFERS AND DEATHS BY DISEASE

Diseases	Remaining on 31-12-63	Admission	Discharge	Transfer to Other Hospital	Deaths	Remaining on 31-12-64
Amœbic Dysentery ..	10	328	308	6	8	16
Amœbic and Bacillary Dysentery ..	..	4	4	..	..	..
Bacillary Dysentery ..	6	144	139	2	3	6
Chicken-pox ..	..	701	656	..	1	44
Chicken-pox with Herpes Zoster ..	..	1	1	..	..	..
Clinical Dysentery ..	6	215	214	..	1	6
Cholera El Tor ..	2	23	21	2	2	..
Diphtheria ..	23	204	189	..	15	23
Diphtheria, Cultural ..	3	37	40	..	..	..
Encephalitis ..	2	..	1	..	..	1
Erysipelas ..	..	1	1	..	..	..
Herpes Zoster ..	..	1	1	..	..	..
Infective Hepatitis ..	1	8	8	1	..	..
Influenza ..	..	55	55	..	..	..
Laryngo-tracheo-bronchitis ..	..	3	3	..	..	..
Measles ..	..	181	172	4	..	5
Measles with Broncho- pneumonia ..	..	98	89	2	7	..
Measles with Encephalitis ..	..	1	..	..	1	..
Measles with Gastro-enteritis ..	..	3	2	..	1	..
Mumps ..	..	29	28	..	1	..
Paratyphoid A ..	..	1	1	..	..	..
Paratyphoid B ..	..	1	1	..	..	..
Paratyphoid C ..	..	1	1	..	..	..
Poliomyelitis (Paralytic) ..	23	12	27	..	..	8
Post Poliomyelitis ..	1	36	25	..	..	12
Pulmonary Tuberculosis ..	..	4	2	2	..	..
Rubella ..	..	21	21	..	..	..
Typhoid fever ..	15	120	124	1	2	8
Typhoid fever (relapse) ..	1	1	2	..	..	..
Typhus (mite) ..	..	1	1	..	..	..
T.B. Meningitis ..	..	1	1	..	..	..
Whooping Cough ..	..	14	12	2	..	..
Other diseases/carriers ..	24	1,280	1,217	25	9	53
Total ..	117	3,530	3,367	47	51	182



CHOLERA, *EL TOR*

There were three outbreaks during the year. The organism responsible was an Ogawa Strain of *El Tor* Vibrio.

The first outbreak in January followed the discovery of a case in a 49 year old Chinese male living in Pasir Panjang. In this outbreak, three cases of cholera were confirmed.

The second outbreak occurred in April after a male Chinese aged 58 years also from Pasir Panjang was found to be suffering from cholera. There were 19 cases of confirmed cholera during the outbreak.

In the third outbreak in August, a cholera case was found in a 43 year old Chinese woman staying in Stanley Street.

Altogether 23 cases of cholera were confirmed during the year out of 370 suspected cholera cases referred to the Hospital. Many of the cases were in a state of circulatory collapse on admission. There were two deaths. One death occurred in a Chinese female aged 71 brought in a collapsed condition. She was an opium addict with severe malnutrition and pulmonary emphysema. The other fatality occurred in a 51 year old Malay man who died five days after admission from anuria with uræmia.

None of the cholera cases had been immunized during the six months prior to admission.

*Cholera Carriers.*—Seven cholera carriers were admitted during the year. Six were relatives of the cholera patients. The seventh was a Malay visitor from Trengganu who was found to be a carrier following routine stool examination of families of staff of the Trengganu General Hospital which was treating Cholera cases. As he had left the State when the stool result was known, the Trengganu Health Authorities informed the Ministry of Health in Singapore and he was traced and admitted to Middleton Hospital for investigation and treatment.

Table 85

CHOLERA

ADMISSIONS AND DEATHS — 1964

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Admissions ..	2	1	..	7	9	3	..	1	..	..	..	..	23
Deaths ..	..	..	..	..	1	1	..	..	..	..	..	..	2





## DIPHTHERIA

204 cases were admitted during the year. Tracheotomy operation for respiratory obstruction was required in 24 cases and these of eight cases died, showing that these cases were brought in at a late stage of the disease.

There were 15 deaths, a mortality rate of 7.35 per cent.

There has been a fall in the number of diphtheria cases following legislation for the compulsory immunisation of children against diphtheria in 1962. This trend continued in 1964 but there was a slight increase in the number of cases at the end of the year.

Table 86

## DIPHTHERIA

## ADMISSIONS AND DEATHS FOR THE PAST 10 YEARS

Year	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Admissions ..	460	552	712	548	519	642	587	353	394	204
Deaths ..	41	47	58	34	23	32	27	13	19	15
Mortality Rate	8.91%	8.51%	8.14%	6.2%	4.43%	4.98%	4.60%	3.68%	4.56%	7.35%

Table 87

## MONTHLY DIPHTHERIA

## ADMISSIONS, DEATHS FOR 1964

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Admissions ..	23	19	15	20	8	12	15	22	8	16	25	21	204
Deaths ..	2	1	..	1	1	1	1	3	3	1	1	..	15

Table 88

## DISTRIBUTION OF DIPHTHERIA BY MONTH AND LOCALITY

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Urban ..	22	17	15	18	8	12	14	17	7	13	23	17	183
Rural ..	1	2	..	2	..	..	1	5	1	3	2	4	21
Total ..	23	19	15	20	8	12	15	22	8	16	25	21	204

Table 89

DIPHTHERIA—ADMISSIONS AND DEATHS BY AGE AND SEX GROUP

Age Group			ADMISSIONS		Total Admissions	DEATHS		Total Deaths
			M.	F.		M.	F.	
Under 1 year	..	..	9	5	14	1	..	1
1 year	..	..	12	14	26	..	1	1
2 years	..	..	19	18	37	3	3	6
3 years	..	..	14	14	28	..	3	3
4 years	..	..	7	9	16	1	..	1
5 — 9 years	..	..	14	30	44	2	1	3
10 — 14 years	..	..	13	14	27	..	..	..
15 — 19 years	..	..	..	7	7	..	..	..
20 +	..	..	..	5	5	..	..	..
Total ..			88	116	204	7	8	15

Table 90

DIPHTHERIA—ADMISSIONS AND DEATHS BY ETHNIC GROUP

Ethnic Group			ADMISSIONS		Total Admissions	DEATHS		Total Deaths
			M.	F.		M.	F.	
Europeans	..	..	..	..	..	..	..	..
Eurasians	..	..	..	1	1	..	..	..
Chinese	..	..	74	100	174	7	8	15
Indians	..	..	10	3	13	..	..	..
Malay-Javanese	..	..	4	12	16	..	..	..
Others	..	..	..	..	..	..	..	..
Total ..			88	116	204	7	8	15



Table 91

DIPHTHERIA—CLINICAL TYPES OF CASES

Type						Admissions	Deaths
Laryngeal	..	..	..	..	..	28	8
Pharyngeal	..	..	..	..	..	46	7
Faucial	..	..	..	..	..	93	..
Nasal	..	..	..	..	..	30	..
Aural	..	..	..	..	..	6	..
Cutaneous	..	..	..	..	..	1	..
Oral	..	..	..	..	..	..	..
Total						204	15

Table 92

DIPHTHERIA — TRACHEOSTOMY OPERATIONS

Number of Tracheostomies done	...	24
Percentage of cases requiring Tracheostomies	...	11.76%
Number of deaths after Treacheostomy	...	8
Case fatality after Treacheostomy	...	33.3 %

*Diphtheria Carriers.*—A total of 37 carriers discovered among diphtheria contacts were admitted for isolation and treatment.

*Acute Anterior Poliomyelitis.*—12 cases of Poliomyelitis were admitted during the year. There was no death. It is hoped that the routine immunization of children with oral sabin vaccine started in 1962 will help in the control of Poliomyelitis.

36 cases of post polio cases were also admitted for rehabilitation and treatment. More cases of post poliomyelitis including those discharged prematurely during the cholera outbreaks could be admitted for treatment during the year because of the smaller number of acute cases.

Table 93

POLIOMYELITIS

ADMISSIONS DURING THE LAST 10 YEARS

Year	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Admissions ..	19	29	52	404	66	201	48	12	66	12
Deaths ..	2	..	..	12	3	6	5	1	1	..

Table 94  
POLIOMYELITIS  
ADMISSIONS BY MONTH

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Admissions ..	2	..	3	2	2	..	..	..	1	..	1	1	12
Deaths ..	..	..	..	..	..	..	..	..	..	..	..	..	..

Table 95  
POLIOMYELITIS  
REGIONAL DISTRIBUTION BY MONTH

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Urban ..	2	..	3	1	..	..	..	..	1	..	1	1	9
Rural ..	..	..	..	1	2	..	..	..	..	..	..	..	3

TYPHOID FEVER

120 cases of typhoid fever were admitted during the year with two deaths. The cause of death in the two fatal cases was acute toxæmia with cardiac failure. One of the cases had intestinal hæmorrhage as well.

The mother of a typhoid case on investigation was found to be typhoid carrier. She was treated for typhoid six years ago in Middleton Hospital. In 1963, a daughter was admitted for typhoid and in 1964 another daughter was admitted for typhoid. As she did the cooking for the family, it is likely she infected her two daughters. Her stools became negative for Salmonella typhi after treatment with a new antibiotic, cephaloridine.

Table 96  
TYPHOID FEVER  
ADMISSION BY ETHNIC GROUP AGE AND SEX

			Age		0—9		10—19		20—29		30+		Total		Total
			Sex		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Europeans	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Eurasians	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chinese	..	..	11	5	22	4	15	2	7	3	55	14	69		
Indians	..	..	3	..	7	1	2	2	1	..	13	3	16		
Malays	..	..	2	4	8	2	5	5	6	2	21	13	34		
Javanese	..	..	..	..	..	..	..	..	..	1	..	1	1		
Total ..			16	9	37	7	22	9	14	6	89	31	120		



Table 97

TYPHOID FEVER  
ADMISSIONS BY MONTH

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Admissions ..	12	9	18	16	7	11	9	2	7	12	7	10	120
Deaths ..	..	..	..	..	1	..	..	..	..	..	..	1	2

*Typhoid Carrier Examinations.*—During the year, a total of 357 persons from ice-cream factories and stalls, school tuck-shops and various restaurants were investigated for exclusion of the typhoid carrier state.

CHICKEN-POX

701 cases were admitted with one death. The fatal case occurred in an 11 years old Indian girl with encephalitis.

Table 98

CHICKEN-POX  
ADMISSIONS BY AGE, SEX AND ETHNIC GROUP

Age		0—10		11—19		20+		Total		Total
Sex		M.	F.	M.	F.	M.	F.	M.	F.	
Europeans	..	..	..	..	1	..	..	..	1	1
Eurasians	..	5	4	1	6	1	3	7	13	20
Chinese	..	29	23	22	9	40	12	91	44	135
Indians	..	59	55	59	32	172	34	290	121	411
Malays	..	19	13	24	11	43	5	86	29	115
Javanese	..	2	1	3	..	3	..	8	1	9
Others	..	2	..	3	2	1	2	6	4	10
Total	..	116	96	112	61	250	56	488	213	701

Table 99

## CHICKEN-POX

## ADMISSIONS BY MONTH

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Admissions ..	1	6	10	62	55	44	49	63	58	79	107	167	701
Deaths ..	..	..	..	..	..	..	..	..	..	..	1	..	1

## DYSENTERY

There were 691 admissions with 12 deaths. 328 cases had amœbic dysentery, four cases had been amœbic and bacilliary dysentery, 144 cases had bacillary dysentery while in 215 cases no specific organisms were isolated.

Table 100

Type of Cases	Admissions	Deaths
Amœbic Dysentery	328	8
Amœbic and Bacilliary Dysentery	4	—
Bacillary Dysentery		
(a) Sonne	86	3
(b) Flexner	48	—
(c) Shigella	10	—
Clinical Dysentery	215	1
Total	691	12

*Amœbic Dysentery Carriers.*—24 cases of amœbic dysentery carriers were admitted from the Girls' Homecraft Centre at Yorkhill. They were detected as the result of stool examinations of the inmates and staff following the occurrence of five cases of amœbic dysentery in the centre.

*Bacillary Dysentery Carriers.*—10 bacillary dysentery carriers were admitted during the year. They were detected during the course of routine stool examination of domestic servants at the Naval Base and of ice-cream sellers applying for licences. They were discharged after treatment and bacteriological clearance.

## MEASLES

283 cases of measles were admitted with nine deaths. 98 cases had bronchopneumonia of which seven died. One case with gastroenteritis and another with encephalitis died.

## FOOD POISONING

Seven cases of food poisoning following ingestion of *nasi lemak* in the Tanjong Pagar area were admitted in July 1964. This was to assist the pressure of beds at the General and Thomson Road Hospitals. Investigation showed that the poison was arsenic.

One case was in a collapsed state and required intravenous fluids. All the cases recovered after treatment and were discharged.



## 20. SOCIAL HYGIENE

THE original and main function of the Social Hygiene Service is the treatment and control of venereal diseases. In 1960 it also became the centre for the treatment of skin diseases, and which now forms a large proportion of the work undertaken in its outpatient clinics.

The services are carried out in the following departments:

- (i) The Middle Road Hospital for the inpatient treatment of venereal and skin diseases. It has accommodation for 61 patients;
- (ii) Outpatients Clinics — one is attached to the hospital, the other is at the Tanjong Pagar Clinic which is primarily for seamen and persons living around the dock area;
- (iii) two mobile dispensary units — one for male and the other for female patients in rural communities;
- (iv) an Epidemiological and Control Unit;
- (v) an Almoner's Department;
- (vi) a Serological Laboratory.

*Teaching.*—Social Hygiene Branch also serves as a centre for the teaching of medical students, nurses, almoners, Public Health inspectors and Social Studies students. Doctors, social workers and Colombo Plan students also attend for observation courses.

*Staff.*—The Senior Medical Officer was Dr. Koh Kim Yam, L.M.S. There were five medical officers, but two were part-time medical officers.

The Almoner's Department was run by an Almoner working part-time as there were insufficient numbers of the social workers to share around the hospital.

*Attendances.*—The number of patients treated in the year is compared with the numbers in the previous years:

		ATTENDANCES				
		1960	1961	1962	1963	1964
Inpatients	...	1,331	1,179	1,285	967	1,055
Outpatients						
New	...	35,331	32,513	31,862	30,312	33,594
Repeats	...	165,771	180,403	165,732	155,578	158,218
Total Outpatients	...	201,102	202,916	197,594	185,890	191,812

INCIDENCE OF VENEREAL DISEASES

Here follows tables on the incidence of venereal diseases as treated in the departments of the Social Hygiene service.

It is not possible to say if these figures reflect a true picture of the prevalence of the diseases. The diseases are not notifiable neither is treatment compulsory. There are probably a large number of persons who are treated by general practitioners, and many who avoid treatment entirely.

The significance of the figures is that they indicate a fairly constant hospital incidence and a reasonable inference is that the sources of infection remain; and the problems of control, prevention and eradication of the diseases will have to be renewed.

Table 101

INCIDENCE OF VENEREAL DISEASES

	1960	1961	1962	1963	1964
Syphilitic Infections ...	860	626	719	574	662
Gonorrhœa ...	2,529	1,970	2,402	1,793	2,378
Total all V.D. ...	4,295	3,335	4,168	2,921	3,910

*Syphilitic Infections.*—The type of syphilitic infections seen is given in table 102. The incidence of early manifestations — primary syphilis, secondary syphilis and early latent syphilis — is a further indicator that the disease continues to be spread:

Table 102

SYPHILITIC INFECTIONS

	1960	1961	1962	1963	1964
Primary Syphilis ...	198	166	114	79	92
Secondary Syphilis ...	24	21	13	46	27
Early Latent Syphilis ...	116	123	212	138	180
Late Latent Syphilis ...	431	316	330	272	294
Tertiary Syphilis ...	69	49	39	68	47
Congenital Syphilis (over 2 years) ...	18	11	21	17	22

Two cases of infantile syphilis were reported in 1964 while there were 22 cases of congenital syphilis over the age of two years.

The manifestations of tertiary syphilis in the main ethnic groups are given in the following tables;



Table 103

BREAKDOWN OF TERTIARY SYPHILIS

Nationality			Gummata and Skin	Bones and Joints	Cardio- Vascular	G.P.I.	Tabes Dorsalis	Neuro Syphilis	Others	Total
<i>Male</i>										
Chinese	..	..	1	1	9	1	4	6	3	25
Indian	..	..	..	..	1	..	..	1	..	2
Malaysian	..	..	1	1	2	1	1	..	..	6
Total			2	2	12	2	5	7	3	33
<i>Female</i>										
Chinese	..	..	..	1	4	..	..	4	..	9
Malaysian	..	..	..	1	1	1	1	1	..	5
Total			..	2	5	1	1	5	..	14
Grand Total			2	4	17	3	6	12	3	47

Table 104

RATIO OF TERTIARY SYPHILIS

		1960	1961	1962	1963	1964
Neuro Syphilis	...	50.7	63.3	59.0	38.2	51.1
Cardiovascular	...	11.6	22.4	33.4	48.5	36.2
Cutaneous	...	13.0	6.1	5.1	1.5	4.2
Bones and Joints	...	24.7	8.2	2.5	11.8	8.5

*Other Venereal Diseases.*—The other venereal diseases as treated by the service are listed in the following table:

Table 105

## OTHER VENEREAL DISEASES

		1960	1961	1962	1963	1964
Gonorrhœa	...	2,529	1,970	2,403	1,793	2,378
Gonorrhœa Ophthalmia	...	106	107	65	78	94
Gonorrhœa Complications	...	9	9	1	2	23
Gonorrhœa and Non-specific Urethritis	...	244	436	487	467	309
Non-specific Urethritis	...	773	1,472	1,127	962	688
Lymphogranuloma	...	7	16	25	12	20
Soft Sore	...	692	472	886	420	666
Mixed Infections	...	100	36	70	42	86

## SKIN CLINIC

11,889 new cases were seen during the year.

Infective dermatitis, atopic and neurodermatitis, allergic, contact and occupational dermatitis and mycotic infections formed the majority of the cases. There were also cases of papulo-squamous eruptions, vesiculo-bullous dermatitis and cutaneous tuberculosis, while internal disorders shown by skin manifestations were transferred to other special clinics.

Twenty-three cases of leprosy were referred to Irrawaddy Road Skin Clinic.

## MOBILE DISPENSARIES

The main reason for running the service is to be able to follow-up and treat known cases of venereal disease and to be able to investigate women during pregnancy for venereal infection. Its work cannot be entirely confined to such cases: it is offered as a general outpatient facility and it will be seen that out of the many investigated only a small proportion are found to be infected with venereal disease.

The service works at a disadvantage as there is no medical officer who accompanies the dispensary so that fewer persons come forward for treatment or accept the investigations.

## SOCIAL HYGIENE MOBILE DISPENSARIES

The following table shows the work done:

Table 106

Clinic	Male	Female	Ante-Natal	V.D. Cases	Invest. Cases	Total
<b>CENTRAL</b>						
Yio Chu Kang	48	3,811	4,571	12	3,847	3,849
Upper Serangoon						
Seletar						
Paya Lebar						



RURAL WEST

Bukit Timah	}	34	4,495	3,793	13	4,516	4,529
Pasir Panjang							
Bukit Panjang							
Holland Road							
Jurong							
Ama Keng	}						

RURAL EAST

Kampong Batak	}		4,600	4,476	24	4,576	4,600
Changi							
Ulu Bedok							
Siglap							
		82	12,906	12,840	49	12,939	12,988

Table 107

ANTE-NATAL CASES

Nationality	No. of Ante-Natals	Primipara	No. with Syphilis	Multipara	No. with Syphilis
Chinese	7,525	1,202	5	6,323	8
Malaysian	1,066	514	3	3,643	14
Indian	4,157	192	2	874	2
Eurasian	26	1	—	25	—
Others	69	15	—	51	—
	12,840	1,924	10	10,916	24

12,840 ante-natal cases were examined of whom 34 cases were found to be positive for syphilis.

EPIDEMIOLOGICAL CONTROL UNIT

This unit is responsible for case finding, contacting defaulters, follow-up of cases, contacting family units, contacting promiscuous women and health propaganda.

13,707 home visits were made to defaulters or contacts of whom 7,633 cases reported.

1,893 cases were contacted by post of whom 504 attended.

340 new family units were registered. These were either treated or kept under surveillance. The total numbr of family units on the register was 4,899.

144 girls under the age of 18 were sent by the Social Welfare Department, 16 cases had gonorrhœa and 13 had syphilis.

*Prophylactic Treatment*

There were 1,895 prostitutes on the register. Of these 114 who were newly registered this year, 24 had gonorrhœa, 13 had syphilis and three had both,

There were 37 male prostitutes on the register of whom four were new cases.

5,805 prophylactic injections were given during the year.

#### ALMONER'S DEPARTMENT

The Senior Almoner reports that because of the overall shortage of almoners it was only possible to send an Almoner once a week on Wednesday mornings.

The major portion of the work dealt with financial and material aid, Social and moral support, rehabilitation and employment as well as total care of the family.

260 cases were on the register of whom 86 were new cases.

Table 108

#### LABORATORY EXAMINATIONS

		1960	1961	1962	1963	1964
Blood specimens for K.T.	...	37,831	37,420	36,812	29,830	30,456
C.S.F. for K.T.	...	330	480	345	191	261
Dark Ground Examinations	...	2,966	3,898	3,102	1,857	1,987
Smears for Gonorrhœa	...	27,396	28,980	22,763	28,626	30,121
Smears for Culture	...	191	214	121	225	265
Trichomonas Examinations	...	—	548	4,469	4,582	4,692
Aqua Penicillin G. used (3 vials)	...	5,386mu	954mu	2,764mu	2,623mu	4,140mu
Procain (PAM) Penicillin (3 vials)	...	19,000mu	13,965mu	4,644mu	4,326mu	12,114mu
Penidure (Bicillin) (3 vials)	...	8,148mu	10,805mu	9,168mu	8,456mu	605mu

There were 32 cases of penicillin sensitivity but no deaths were reported.



TABLE 109  
PATIENTS BY COURSE

	INPATIENTS			OUTPATIENTS (NEW CASES)			OUTPATIENTS (REPEATS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Primary Syphilis ..	..	1	1	89	3	92	2,368	78	2,446
Secondary Syphilis ..	4	5	9	23	4	27	1,026	188	1,214
Tertiary Syphilis ..	37	13	50	33	14	47	3,825	429	4,254
Congenital Syphilis ..	1	4	5	6	16	22	244	185	429
Syphilis not specified ..	76	66	142	258	216	474	8,210	4,916	13,126
Gonorrhœa ..	3	99	102	1,979	399	2,378	11,159	2,778	13,937
Gonorrhœa Complications ..	2	12	14	1	22	23	..	3	3
Gonorrhœa Ophthalmia ..	..	102	102	..	94	94	..	..	..
Soft Sore ..	..	..	..	666	..	666	5,041	..	5,041
Lymphogranuloma ..	..	..	..	20	..	20	32	1	33
Mixed Infections ..	..	..	..	39	..	39	1,198	1,671	2,869
Investigation Cases ..	8	44	52	4,035	13,741	17,775	13,026	3,273	16,299
Skin Cases ..	223	373	596	7,474	4,415	11,889	68,475	30,091	98,567
Total ..	354	719	1,073	14,623	18,971	33,547	114,605	43,613	158,218

TABLE 110  
PATIENTS BY RACE

	INPATIENTS			OUTPATIENTS (NEW CASES)			OUTPATIENTS (REPEATS)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Malays and Malaysians	54	96	150	1,952	4,987	6,939	13,092	6,304	19,396
Chinese	221	574	795	8,346	12,059	20,405	68,249	32,684	100,933
Indian, Pakistanis and Ceylonese	78	36	114	3,341	1,657	4,998	31,951	3,216	35,167
Others	1	13	14	984	268	1,252	1,313	1,409	2,722
Total	354	719	1,073	14,623	18,971	33,594	114,605	43,613	158,218



## 21. TAN TOCK SENG HOSPITAL

### (TUBERCULOSIS)

THE Tan Tock Seng Hospital is mainly for the treatment of pulmonary tuberculosis. But this has not always been so. Prior to the Pacific War it was a general hospital for the indigent and was also used for the clinical teaching of medical students.

After the war, its wards were turned over to patients suffering from pulmonary tuberculosis, but not entirely, as there were a few wards which were occupied by chronically sick and to this day there is still one ward still being used to house chronic sick.

In 1963 three wards were given over for adult medical cases. This was to take-off some of the load on the medical units in the General Hospital.

The Hospital consists of three sections; an old section consisting some of the original buildings which were built in 1909; a section consisting of four modern ward blocks which were completed in 1958 and a section known as the Mandalay Road Unit which is used for women and children. The total accommodation available in the wards of the hospital is 1,320.

Within the compound of the hospital is the hospital's Outpatient Department known as the Rotary Clinic as it was built from funds made available by the Rotary Club in 1951.

Construction work on a Thoracic Surgical Block began in April 1964 and is expected to be completed towards the end of 1965. The Surgical Block will house the suites of the surgical operation theatres, and their ancillary rooms which will include monitoring rooms, recovery rooms and X-ray department.

*Staff.*—The Medical Superintendent of the hospital was Dr. H. F. Jackson until 1st August, 1964 when he went on transfer and Dr. Andrew Chew was appointed in his place. The medical officer staff consisted of a Senior Chest Physician and three chest physicians, and two senior registrars and eleven medical officers.

Although this staff was just over half the authorised complement two medical officers were allowed to go overseas for post-graduate qualifications and a chest physician, Dr. J. Supramaniam, went to various tuberculosis centres in Asia and Africa on a W.H.O. Fellowship.

The shortage of staff extended also to laboratory technicians down to medical and health servants. The shortage is now felt as the tempo of work has increased since the establishment of the medical wards and the treatment of more acutely ill patients.

*Special Studies.*—Studies were continued on the incidence of positive sputum cultures from patients with minimal pulmonary tuberculosis lesions;

blood levels on PAS, the treatment of drug resistant cases of tuberculosis with second-line anti-tuberculous drugs.

A drug trial using Unitheban is being conducted.

A growing problem is the increasing incidence of drug resistant cases of pulmonary tuberculosis. About a fourth only are being treated with the second-line drugs such as viomycin, kanamycin, cycloserine, pyrazinamide and ethionamide. Trials have been conducted with these drugs used singly but more often in combinations for periods extending over a year. These drugs are comparatively costly and the drug-vote has risen chiefly because of the use of these drugs.

*Contract Service.*—The tracing of contacts of patients was up to August the responsibility of each of the Chest Units. After this date this function was transferred to the Tuberculosis Control Unit.

As part of the re-organisation, the system of case recording for the tracing of patients who default in their treatment was tested and will be put into operation from 1st January, 1965.

*Central Sterile Supply.*—The department has been in operation for two years. While it is fulfilling its functions satisfactorily, it is possible that it has not been used to its full capacity. Sputum mugs were being sterilised only twice a week have since November been sterilised daily. For lack of syringe and needle cleaners such instruments are being cleaned by hand.

### INPATIENTS

Admission to hospital for inpatient treatment continued to be made according to priorities on medical and social grounds. A return of tuberculosis cases admitted to Government hospitals in the State is shown in Table 111.

Table 111

#### TUBERCULOSIS CASES ADMITTED TO GOVERNMENT HOSPITALS

##### Tan Tock Seng Hospital

	1957	1958	1959	1960	1961	1962	1963	1964
Pulmonary	2,442	3,064	2,588	2,752	2,562	3,089	3,136	2,930
Bones and Joints	133	171	169	115	129	26	95	67
Other forms	27	41	62	43	54	69	91	71

##### General Hospital

Pulmonary	942	785	660	703	647	600	594
Bones and Joints	302	338	332	157	293	197	189
Other forms	122	242	252	230	196	115	119

##### St. Andrew's Orthopædic Hospital

Pulmonary	—	—	—	19	21	5	2
Bones and Joints	235	245	121	115	238	138	32
Other forms	—	—	—	—	1	2	—

4,203	4,886	4,184	4,134	4,141	4,241	4,258
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This is the Clinic for the treatment of outpatients, and the following table 112 is an indication of the volume of work done:

Table 112

ROTARY TUBERCULOSIS CLINIC					
	1960	1961	1962	1963	1964
New cases of tuberculosis ...	2,863	3,613	3,231	3,006	2,665
Repeat visits of cases of tuberculosis	342,760	399,211	475,470	347,899	287,769
Cases for assessment seen by Chest Physicians and Senior Registrars:					
(a) New cases ...	2,703	3,613	2,597	2,210	2,004
(b) Repeat cases ...	47,935	49,173	50,579	39,371	37,120
Medical Cases ...	—	—	—	332	1,839
X-Ray Examinations ...	78,094	85,576	92,419	84,817	83,144
Laboratory Examinations ...	94,034	109,125	130,407	127,529	165,211
P.P. Inductions ...	48	21	11	10	—
P.P. Refulls ...	6,046	3,646	2,382	1,384	707

The following investigations were carried out during the year by the various units:

*Bronchoscopy.*—Bronchoscopies were performed thrice weekly, and a total of 313 were carried out.

*Bronchograms.*—229 Bronchograms were done by medical officers on specially selected cases.

*I.V.P.*—Intravenous Pyclography was done on 150 cases.

*Sinograms.*—Three Sinograms were performed during the year.

*Pleural Biopsy.*—A total of 55 biopsies were performed.

Bronchoscopies and minor operations were carried out during the year. The following were major thoracic surgeries done by surgeons at the General Hospital:

Thoracoplasty	...	17
Resections:		
Segmental	...	4
Lobectomy	...	40
Pneumonectomy	...	9
		—
		70
		—

PHYSIOTHERAPY DIVISION

The work in the department has increased especially with the establishment of the medical wards and will increase when thoracic surgery is undertaken when the new surgery is opened.

## SUMMARY OF WORK

Year		Courses of Treatment
1956	...	22,118
1957	...	18,357
1958	...	25,032
1959	...	28,054
1960	...	20,019
1961	...	21,786
1962	...	18,634
1963	...	12,655
1964	...	16,031

## OCCUPATIONAL THERAPY DEPARTMENT

Another Occupational Therapist was appointed to the service. This helped to cope with the increasing demand of occupational therapy. A total of 23,980 were given occupational therapy treatment. Of these 521 were new patients.

In addition, this Department gave training in tailoring, basket and lamp-shade making, machine art-embroidery and machine-knitting to 96 disabled persons, an increase of 3 when compared with the previous year. The aim behind this training is to restore confidence in disabled persons and to fit them into remunerative employment after training.

## RED CROSS LIBRARY

The Red Cross Society continued to help maintain the Library. Magazines and books were distributed to patients by these voluntary helpers on Tuesdays and Thursdays.

During the year, this Society was given a larger room for its Library.

## DENTAL CLINIC

A change was instituted during the year towards improving facilities for dental treatment to patient. The Dental Officer was available for consultation in every morning of the week except Saturday. In previous years he visited the Dental Clinic twice a week, on Tuesday mornings and Friday mornings.

Dental treatment included extractions, fillings, minor oral surgery and the fitting of dentures. For dentures, patients previously had to be referred to General Hospital Dental Clinic for the impressions and fitting of the dentures.

Patients requiring major surgical treatment were still referred to General Hospital Dental Clinic. The Thoracic Unit will have a Dental Clinic equipped with modern equipment and it will be possible to cope with the major dental surgery.

## ALMONER'S DEPARTMENT

A total of 14,391 cases were seen of which 2,737 were new cases and 11,654 were current cases and 197 non-citizen cases.

Administration of the Tuberculosis Treatment Allowance and Public Assistance was carried on as in previous years. 552 patients for T.B.T. Allowance and 212 for Public Assistance Allowance.



## 22. TRAFALGAR HOME (LEPROSY)

TRAFALGAR Home is an institution for the segregation and treatment of persons suffering from leprosy. It is situated in a former rubber estate from which it got its name, off the Yio Chu Kang Road, about  $8\frac{3}{4}$  miles from the centre of the City.

The total area of the Home is about 125 acres but the area occupied and bounded by a fence is about 25 acres; the remaining land is occupied by squatters several of whom are former patients. The Home comprises of hospital ward blocks which form the infirmary section and outbuildings consisting of semi-detached chalets and dormitories for the accommodation of ambulant patients. The total accommodation available was 965 — the reduction in the bed complement being the withdrawal of a ward and its conversion into a workshop for the Occupational Therapy Department.

Patients are admitted if lepræ bacilli are found in their lesions. Admission and discharge of such patients is controlled by the Leprosy Board. Discharges are approved when smears from the skin lesions are found free of lepræ bacilli on four occasions each taken in consecutive months. The Board has relaxed on discharges somewhat in recent years, allowing for “conditional” discharges which are given in special circumstances.

There is an Outpatient Clinic for the treatment of non-infectious patients and for the follow-up of patients discharged from the Home. The staff of the Clinic is also responsible for the Contact service.

The Contact Service is responsible for maintaining the register of all leprosy patients, tracing contacts, and the surveillance of patients under treatment as outpatients.

*Staff.*—The Medical Superintendent is Dr. Wong Mook Ow, there are two medical officers.

As mentioned in the previous year's report, there has been a gradual increase in the “healthy” staff in proportion to the number of “patient-workers”. Almost the entire staff in the Skin Clinic and all the supervisory staff in the Home are “healthy”. But the bulk of the work-force of the Home is drawn from the patients who are engaged as artisans, hospital orderlies, dispensary assistants, laboratory assistants, tailors, cooks and in unskilled jobs.

Two members of the nursing staff went overseas for training. A nursing sister undertook a course sponsored by Colombo Plan in leprosy nursing. Another male nurse, also under Colombo Plan scholarship was undergoing a 6-month training in the rehabilitation of leprosy patients.

A staff nurse who had taken the Public Health Course returned to the staff of the Home after completing successfully the course.

*School.*—As more qualified staff for the school was available, more vocational subjects such as woodwork, book-binding, silk-screen printing, and needle-work were included in the school curriculum.



*Physiotherapy Department.*—The department was fortunate to obtain for the first time a qualified physiotherapist. With the assistance of the physiotherapist's aide who was a patient trained in the routine and simpler physiotherapy procedures, patients can now be attended entirely in the Home without having to be sent to the General Hospital.

*Occupational Therapy Department.*—Sales of patients' work reached a record in 1964. This was due largely to voluntary help. In this connection special mention is made to a dedicated couple, Mr. & Mrs. Rexter, for their kind services.

During the latter half of the year, a training scheme was introduced in which all new patients had to undergo training in a suitable craft. The training was based on a fairly comprehensive syllabus and included some theoretical instruction. The purpose of the scheme was to help patients on discharge to organise themselves into a productive project and eventually work in sheltered workshops or factories.

*Dental Clinic.*—The demand for dental treatment and for dentures continues to increase. There is a great problem of maintaining good oral hygiene among patients who have maimed hands. Frequently, patients who have just had their teeth scaled and filled return a short while after with caries and abundant calculus due to neglect of their hygiene. It is important that the nursing staff should assist in the constant supervision of patients in the wards to maintain good oral hygiene.

The total attendances for dental treatment were 1,381.

*Almoner's Department.*—The Almoner's responsibilities lie not only with the inpatients but also with all the patients seen at the Skin Clinic. The work in the department continued at very much the same level as the problems remain as in previous years. The first being to assist the patient to institutional life when segregated and to assist in the care of the family when its bread winner or mother is under treatment in the Home. The other is to assist in the rehabilitation of a discharged patient, which is mainly the finding a new job — which is not an easy one because of the prejudice towards and the stigma of the disease.

Valuable assistance continued to be given by the State's social services, voluntary organisations, particularly the Singapore Leprosy Association, Women's Guilds.

*Development.*—A Community Hall was completed at the beginning of the year and opened by Mr. Ng Kah Ting, Assemblyman for Ponggol on 7th March, 1964 at a cost of \$23,750.

The Hall was built from money realised from the sale of S.S. Debenture Stock which had been donated by the trustees in memory of the late Mr. Gaw Kek Law and from the Singapore Leprosy Association which donated \$13,000 and the balance of \$3,000 was drawn from the Leper Aid Fund.

A Surgical Operation Theatre was completed on 8th December, 1964 at a cost of \$17,600. Construction work was chiefly in extensions and

remodelling of a small dressing theatre in the main hospital block. With the theatre it is now possible to perform operations on leprosy patients in the Home itself without having to send them to the General Hospital. But the surgeons and anæsthetists will still be drawn from the General Hospital.

*Record of Work.*—The record of hospital activity is given in the following tables 113, 114, 115, 116 and 117. The downward trend in the numbers of patients treated continues. The average occupancy is now 596 as compared to 630 for the previous year and represents about 61 per cent occupancy of its total accommodation.

Perhaps the more significant figures are given in Table 115 of the different types of patients admitted to the Home. Newly discovered patients with “positive” smears numbered 75 which is a small drop over the previous year’s figure of 85 but is again part of a continuing downward trend in the numbers of fresh infections found.

Table 113  
PATIENTS ON 31ST DECEMBER, 1964 — ADULTS AND CHILDREN  
(Under 12 years of age)

Males		Females		Total
Adults	Child	Adults	Child	
382	46	142	24	594

Table 114  
ADMISSIONS AND DISCHARGES

	Males	Females	Total
Total patients remaining on 31-12-63 ...	441	171	612
Admissions ...	233	67	300
Transferred from other hospitals ...	32	8	40
Discharges ...	230	66	296
Absconded ...	9	1	10
Transferred to other hospitals ...	36	10	46
Deaths ...	3	3	6

Table 115  
ADMISSIONS IN 1964 — BY RACE

		Chinese		Indians		Malays		Eurasians	
		M	F	M	F	M	F	M	F
Adults	...	181	52	23	1	11	2	—	1
Child	...	16	9	1	—	—	2	—	—

Table 116  
ADMISSIONS IN 1964 — BY CAUSE

	Males	Females	Total
New positive cases ...	53	22	75
Returned absconders ...	6	—	6
Relapsed cases ...	15	2	17
Others for treatment for orthopædic treatment ...	158	43	201
<hr/>			
Total ...	232	67	299
<hr/>			



Table 117

## DISCHARGES IN 1964

		Males	Females	Total
Disease-arrested cases discharged				
by Board	...	80	32	112
Conditional discharge	...	21	6	27
"Negative" cases	..	129	28	159
		—	—	—
Total	...	230	66	298
		—	—	—

*Skin Clinic.*—An additional outpatient session was opened in June. It was held every Friday morning for patients referred as possible cases of leprosy. The majority of the patients were suffering from skin diseases. Out of 276 patients seen in the Clinic during the seven months only one patient was found to be suffering from leprosy.

622 persons were brought to the Clinic by the Contact Service and 15 were found to have leprosy.

The numbers of patients seen in the Skin Clinic are given in the following table 118.

Table 118

## GOVERNMENT SKIN CLINIC, IRRAWADDY ROAD

## OUTPATIENTS FOR THE YEAR 1964

Nationalities	NEW CASES				RE-ATTENDANCES			
	Male	Fe- male	Child- ren	Total	Male	Fe- male	Child- ren	Total
Malays and Other Malay- sians .. ..	9	3	6	8	319	114	40	473
Chinese .. ..	122	40	21	183	3,892	3,049	249	7,190
Indians, Pakistanis, and Ceylonese .. ..	34	1	3	38	1,359	116	39	1,514
Others .. ..	..	2	..	2	11	21	7	39
Total ..	165	46	30	241	5,581	3,300	335	9,216



## 23. WOODBRIDGE HOSPITAL (PSYCHIATRY)

THE psychiatric services are centred chiefly in the Woodbridge Hospital and in outpatient centres. One of the outpatient centres is in the General Hospital, the others are in the premises of Outpatient Dispensaries of Kallang, Paya Lebar and Bukit Timah.

*Staff.*—The Medical Superintendent was Dr. Yap Meow Foo and Deputy was Dr. E. C. Winslow. There were two senior registrars and seven medical officers on the staff during the year.

The nursing staff was strengthened, the numbers standing at 296 nurses of all grades in comparison to the number of 227 in the previous year. It is clear that the numbers are far short of the optimum, but it will take some time before there will be sufficient nurses to provide for the entire nursing care of patients.

*Inpatients.*—The large number of patients requiring admission and who had to be maintained in the hospital constituted the biggest problem faced by the hospital.

The average occupancy was 3,466 or an occupancy rate of 185 per cent. The overcrowding in the wards needs no imagination to visualise. During the year, a Committee of Inquiry into the Overcrowding was studying the problem and its solution.

There is no doubt, however, that the position has been reached because of a failure to expand the psychiatric services in proportion with the natural increase in demands from a growing population and where there has perhaps been a real increase in mental disease in the population.

There are a large proportion of patients who have become so institutionalised and many who have lost all contacts with relatives that it has not been possible to discharge them when they have become stabilised.

Much has been achieved by the Social Workers to return some of these patients home. The Outpatient Psychiatric Clinics have also played a significant role in allowing for the early discharge of patients for allowing their continued treatment outside the hospital. These clinics might be increased and day-centres might be formed to take on a bigger load off the hospital, but it is apparent that additional hospital beds are still required.

*Psychiatric Clinics.*—The return for outpatients treated in the Psychiatric Clinics is given in the following tables 119 and 120.

Table 119

## PSYCHIATRIC CLINICS

## OUTPATIENTS—DISTRIBUTION BY RACE

Race	GENERAL HOSPITAL CLINIC		KALLANG CLINIC		PAYA LEBAR CLINIC		BUKIT TIMAH CLINIC		Total
	New	Re-attendances	New	Re-attendances	New	Re-attendances	New	Re-attendances	
Chinese .. ..	679	3,035	844	8,753	288	2,806	145	1,242	17,792
Indians, Pakistanis, Ceylonese ..	127	354	102	546	45	156	27	139	1,496
Malays .. ..	68	135	73	456	14	87	12	40	885
Others .. ..	14	54	30	189	9	87	1	1	385
Total ..	888	3,578	1,049	9,944	356	3,136	185	1,422	20,558

TABLE 120

## PSYCHIATRIC CLINICS

## OUTPATIENTS—DISTRIBUTION BY SEX

Sex	GENERAL HOSPITAL CLINIC		KALLANG CLINIC		PAYA LEBAR CLINIC		BUKIT TIMAH CLINIC		Total
	New	Re-attendances	New	Re-attendances	New	Re-attendances	New	Re-attendances	
Male .. ..	487	1,956	584	5,209	201	1,421	90	618	10,566
Female .. ..	401	1,622	465	4,735	155	1,715	95	804	9,992
Total ..	888	3,578	1,049	9,944	356	3,136	185	1,422	20,558



## 24. THE OUTPATIENT SERVICES

THE following are grouped under the Outpatient Services:

- (i) The Outpatient Dispensaries;
- (ii) The Travelling Dispensaries;
- (iii) The Government-Staff Dispensaries;
- (iv) The Institutional Hospitals:  
The Prison Hospitals at Pearl's Hill and Changi Prison.  
The Opium Treatment Centre at St. John's Island, and  
prior to the re-organisation of the Outpatient Service,
- (v) The Casualty Unit of the General Hospital.

The Outpatient Service is essentially a general practitioner type of service. It should be noted that the Outpatient Clinics run by the hospitals and hospital units are quite separate from this organisation. These clinics are speciality clinics where patients are followed-up or where consultations are undertaken.

### HISTORY

It may be relevant to recount the history of the service which was given in the previous year's report. The re-organisation of the service culminates the development of the service as an independent organisation.

The Outpatient Service has a short history going back only a decade. It began as an Admission Room of the General Hospital manned by the hospital's doctors. In 1952, it separated out as an independent department and in 1953 moved into its own building in the grounds of the General Hospital.

It extended outside the General Hospital by the establishment of satellite dispensaries throughout the island. At first, these dispensaries were opened in shop houses. In 1958, it acquired its first specially-designed building at Pegu Road and thereafter its growth continued rapidly with the development of all types of dispensaries and in many different places. These are new dispensaries of standard design, specially-designed dispensaries; dispensaries combined with Maternal and Child Health Centres and dispensaries incorporated in Community Centres or Housing Board flats.

In 1960, the former City Council Public Dispensaries and Staff Clinics were incorporated in the service as part of the integration of City Council Departments with Government.

The pace of development was accelerated in the last six years. A total of ten Outpatient Dispensaries were built during the period 1959 to 1964, four of which were built in 1963 alone.



The tempo of building was deliberately slackened during the year although the building programme had not yet been realised. Only the Maxwell Road Dispensary was completed during the year. It seemed unrealistic to continue adding buildings to run ahead of the available staff.

Continuing with the development was aggravating the staff shortages, and was adversely affecting the other sectors in the medical services.

It was timely that a review of the development programme was undertaken which also gave opportunity for a hard look to be taken on the service itself. The result was the decision to define its functions and the re-organisation of the service.

### *Reorganisation*

The main purpose of the re-organisation was the definition of the functions of the Outpatient Service. It was to provide a dispensary service for the treatment of minor ailments (and injuries) in outpatients.

In contrast, patients of a different category who were sent in consultation, or recalled for follow-up treatment; patients suffering from serious illnesses and injuries requiring immediate and urgent attention, were to be seen in the hospitals clinics.

The aim was to complete the separation of the Outpatient Service as an independent organisation while the hospitals developed their own speciality and emergency services.

For this end, the significant changes were the withdrawal of the Outpatient Service Office and its Outpatient Dispensary in the General Hospital to Maxwell Road, and for the same reason its dispensary for female and children at Kandang Kerbau Hospital was closed.

In its place in the General Hospital was formed the Emergency-Admission Unit of the hospital. At Kandang Kerbau Hospital the premises vacated by the Outpatient Dispensary was turned over to some of the speciality clinics run by the hospital.

On August 1, 1964, the following changes were effected:

- (i) The Outpatients Departments at the General Hospital and at the Kandang Kerbau Hospital were closed;
- (ii) The Casualty Department which was run as part of the Outpatients Department at the General Hospital was transferred to the Department of Orthopædic Surgery *O* and renamed the Emergency Unit, General Hospital;
- (iii) The Maxwell Road Dispensary was opened and the administrative office of the Outpatient Service was transferred to this building. The Service came out with one less Outpatient Dispensary in these changes: whereas there were 32 dispensaries before, there were now 31;

- (iv) A nominal charge of 50 cents for each attendance was extended to 26 Outpatient Dispensaries (12 dispensaries were already charging these rates before — see previous year's report). Charges were not made for attendances at the part-time dispensaries at Jalan Eunos, Gulega Road, Changi Road and at the Island Dispensaries at Pulau Tekong and Pulau Brani.

### *Development*

The Maxwell Road 4-storey building was renovated at the cost of \$88,000. The ground and first floor are occupied by the Maxwell Road Outpatient Dispensary and the 2nd floor houses the Outpatient Service Administrative Headquarters. The 3rd floor is used as quarters and stores. The Maxwell Road Outpatient Dispensary was opened to the public on 1st August, 1964.

The extension to the Thomson Road Outpatient Dispensary was started in November 1964, and it is expected to be completed by February 1965.

### *Staff*

The staff consists of a Superscale *E* Administrative Medical Officer-in-Charge of Outpatient Services, Dr. Toh Chiong Hieng.

Dr. Leong Hon Koon was appointed Senior Registrar in March 1964, and he has been the Acting Deputy Medical Officer-in-Charge Outpatient Services, Grade *G* since 12th August, 1964.

The other categories of staff are given in two lists. Table 121 shows the staff before the re-organisation and Table 122 shows the staff after the re-organisation.

Table 121  
DISTRIBUTION OF STAFF, OUTPATIENT SERVICES  
(Before Re-organisation)

Outpatient Dispensaries	Medical Officers	Pharmacists	Matron	Sisters	Nurses	Nurses (Man)	Hospital Assistants	Clerks	Dispensing Assistants	Laboratory Technicians
Aljunied Road	1	..	..	..	2	..	..	1	1	..
Bukit Panjang	2	1	..	1	2	..	..	1	2	1
Bukit Timah	1 P.T.	..	..	..	1	..	1	..	..	..
Desker Road	1	..	..	..	2	..	1	1	..	..
Dunearn Road	1	..	..	..	3	..	1	1	..	..
G. H. and Casualty Unit	21	..	1	2	20	16	..	15	..	2
Holland Road	1 P.T.	..	..	..	1 P.T.	..	1 P.T.	1 P.T.	..	..
Jalan Kayu	1	..	..	..	1	..	..	1	1	..
Kallang	4	1	..	1	4	..	..	3	4	1
Kampong Bugis	1	..	..	..	1	..	..	1	1	..
Kandang Kerbau	2	..	..	1	1	..	..	..	..	..
Kee Seng Street	1	..	..	..	2	..	1	..	..	..
Lim Ah Pin	1	..	..	..	2	..	..	1	1	..
New Bridge Road	1	..	..	..	2	..	1	1	..	..
Pasir Panjang	1	..	..	..	1	..	1	1	..	..
Paya Lebar	2	..	..	1	3	..	1	1	1	1
Pegu Road	3	1	..	..	2	..	..	1	3	..
Prince Philip Avenue	1	..	..	..	2	..	1	1	1	..
Queenstown	1	1	..	1	1	..	..	2	1	..
	1 P.T.	..	..	..	..	..	..	..	..	..
Rochore	1	..	..	..	2	..	..	2	1	..
Sembawang	1	..	..	1	1	..	..	2	1	..
Somapah	1	..	..	1	1	..	..	1	1	..
Still Road	2	1	..	1	1	..	..	2	2	..
Stirling Road	1	..	..	..	2	..	1	1	..	..
Thomson Road	1	..	..	..	2	..	..	..	1	..
Tiong Bahru	2	1	..	1	1	..	..	1	1	..
Upper Serangoon Road	1	..	..	..	2	..	..	1	1	..

P.T. = Medical Officer in attendance at the dispensary part-time, e.g. twice weekly or in the mornings only.



Table 122  
DISTRIBUTION OF STAFF, OUTPATIENT SERVICES  
(After Re-organisation)

Outpatient Dispensaries	Medical Officers	Pharma-cists	Matron	Sisters	Nurses	Nurses (Man)	Hospital Assis-tants	Clerks	Dispensing Assis-tants	Labora-tory Techni-cians
Aljunied Road	2	.. 1	..	.. 1	3	..	..	1	2	.. 1
Bukit Panjang	2	..	..	.. 1	2	..	..	2	2	..
Bukit Timah	1	..	..	..	2	..	..	2	1	..
Desker Road	1	..	..	..	2	..	.. 1	1	..	..
Dunearn Road	1	..	..	..	3	..	1	1	..	..
Holland Road	1 P.T.	..	..	..	1	..	1	1	..	..
Jalan Kayu	1	..	..	..	1	..	..	1	..	..
Kallang	5	.. 1	..	.. 1	1	..	..	1	..	.. 1
Kampong Bugis	1	..	..	..	4	..	..	4	1	..
Kee Seng Street	1	..	..	..	2	..	.. 1	1	..	..
Lim Ah Pin	1	..	..	..	2	..	..	2	.. 1	..
Maxwell Road	3	.. 1	..	.. 1	3	2	..	3	2	.. 1
New Bridge Road	2	..	..	..	2	..	.. 1	1	..	..
Pasir Panjang	1	..	..	..	1	..	1	1	..	..
Paya Lebar	3	..	..	.. 1	3	..	1	1	.. 1	..
Pegu Road	3	.. 1	..	..	2	..	..	2	1	.. 3
Prince Philip Avenue	1	..	..	..	2	..	.. 1	1	..	..
Queenstown	2	.. 1	..	..	2	..	..	2	.. 3	..
	1 P.T.	1	..	..	3	..	..	2	2	..
Rochore	3	..	..	..	2	..	..	2	1	..
Sembawang	1	..	..	..	2	..	..	2	1	..
Somapah	1	..	..	..	2	..	..	1	1	..
Still Road	3	.. 1	..	..	3	..	..	2	3	..
Stirling Road	1	..	..	..	2	..	.. 1	1	..	..
Thomson Road	1	..	..	..	2	..	..	1	..	..
Tiong Bahru	3	.. 1	..	..	3	..	..	2	3	.. 1
Upper Serangoon Road	1	..	..	..	2	..	..	1	1	..

P.T. = Medical Officer in attendance at the dispensary part-time, e.g. twice weekly or in the mornings only.

### *Charges*

There was an economic reason for the extension of charges to all the dispensaries: this was to re-coup some of the expenses for the service. The service had been entirely free previously and extended to the supply of free medicine bottles and containers. The total expenditure for the service in the year was \$3,622,423 and represented about 10 per cent of the Hospitals expenditure, and the cost for treating a patient in the service was estimated to cost about \$1.

It was estimated that revenue will be about \$550,000 for a year. The collection of fees in the 26 Outpatient Dispensaries for the months of August to December amounted to \$228,224.

Exemptions extend to fairly wide classes of patients: the Government officer and his family, persons on social assistance, persons suffering from tuberculosis, leprosy and diabetes. About 26 per cent are in the exempted classes.

The other reason was to discourage persons, to attend at dispensaries, who really did not need any attention at all.

### *Observations of Changes in the Outpatient Services after Re-organisation*

There has been a noticeable change in the types of patients that attend the dispensaries following the charging of 50 cents:

- (a) increase in the genuine sick patients;
- (b) reduction in the "perpetually weak" type of patients;
- (c) reduction in the "family might as well be seen" type.

(b) and (c) are the types of patients used to take advantage of the free medical services.

Cases of minor injuries and abscesses are now treated at the Outpatient Dispensaries. These types of cases take up considerable time from all levels of staff.

It is noticed that since re-organisation on 1st August, 1964, the number of cases seen by doctors (not including dressings and injections) continue to increase. The total number of patients seen during the five months from August to December 1964, were:

		Number of Patients seen by Doctors	Number of Injections and Dressings
August	...	79,981	37,033
September	...	80,933	30,511
October	...	93,408	38,785
November	...	88,531	36,405
December	...	94,651	40,193

## OUTPATIENT DISPENSARIES

The figures of attendances for two periods: one before and one after re-organisation are given in Tables 123 and 124. As in the previous year, the attendances are given for those who attend for the first time and those who re-attended at the dispensaries.

Attendances for injections and dressings are given separately instead of being added to the figures for re-attendances as these were for patients who went directly for treatment without seeing the doctors again.

Table 123

OUTPATIENT ATTENDANCES FROM 1ST JANUARY TO 31ST JULY, 1964  
(Before the Re-organisation of Outpatient Services)

Outpatient Dispensaries		New Cases	Repeats	Injections and Dressings	Total
Aljunied Road	...	8,782	16,667	4,930	30,379
Bukit Panjang	...	12,511	17,686	21,099	51,296
Bukit Timah	...	318	8,187	2,895	11,400
Desker Road	...	10,979	13,495	9,538	34,012
Dunearn Road	...	6,362	11,167	7,911	25,440
General Hospital Outpatient Department	...	123,334	94,309	144,023	361,666
General Hospital Casualty Department	...	56,242	14,281	71,404	141,927
Holland Road	...	886	1,106	504	2,496
Jalan Kayu	...	3,244	14,540	9,862	27,646
Kallang	...	19,594	49,233	73,229	142,056
Kampong Bugis	...	3,864	12,662	9,083	25,609
Kandang Kerbau Hospital	...	1,713	16,269	17,982	35,910
Kee Seng Street	...	5,967	7,246	4,562	17,775
Lim Ah Pin	...	3,525	15,339	26,338	45,202
Maxwell Road	...	—	—	—	—
New Bridge Road	...	6,989	11,722	5,199	23,910
Pasir Panjang	...	6,073	12,127	10,270	28,470
Paya Lebar	...	7,423	26,504	40,815	74,742
Pegu Road	...	13,907	30,779	34,069	78,764
Prince Philip Avenue	...	18,223	5,410	11,152	34,785
Queenstown	...	7,207	13,748	6,099	27,054
Rochore	...	6,966	10,401	4,934	22,301
Sembawang	...	5,926	6,870	7,027	19,823
Somapah	...	6,411	12,208	25,244	43,863
Still Road	...	10,744	16,668	15,161	42,573
Stirling Road	...	7,125	4,508	4,993	16,626
Thomson Road	...	7,162	4,993	12,055	24,075
Tiong Bahru	...	7,088	24,323	25,249	56,660
Upper Serangoon Road	...	5,197	15,893	10,216	31,306
Total	...	373,762	488,341	382,434	920,389



Table 124

OUTPATIENT ATTENDANCES FROM 1ST AUGUST TO 31ST DECEMBER, 1964  
(After the Re-organisation of Outpatient Services)

Outpatient Dispensaries		New Cases	Repeats	Injections and Dressings	Total
Aljunied Road	...	7,361	15,100	4,036	26,497
Bukit Panjang	...	6,205	11,629	6,244	24,078
Bukit Timah	...	5,637	4,180	5,878	15,695
Desker Road	...	6,699	8,640	6,152	21,491
Dunearn Road	...	5,422	6,406	3,050	14,878
Holland Road	...	594	373	41	1,008
Jalan Kayu	...	1,806	7,276	3,679	12,761
Kallang	...	18,365	26,976	23,025	68,366
Kampong Bugis	...	2,936	8,398	2,781	14,115
Kee Seng Street	...	5,667	4,997	3,845	14,509
Lim Ah Pin	...	4,784	6,578	7,241	18,603
Maxwell Road	...	17,751	13,428	16,480	47,659
New Bridge Road	...	7,209	10,387	10,185	27,781
Pasir Panjang	...	2,856	4,658	4,849	12,363
Paya Lebar	...	8,097	14,846	15,250	38,193
Pegu Road	...	8,230	18,159	4,853	31,242
Prince Philip Avenue	...	4,157	9,552	2,808	16,517
Queenstown	...	8,241	12,075	7,988	28,304
Rochore	...	9,885	18,223	8,187	36,295
Sembawang	...	4,211	6,215	3,097	13,523
Somapah Road	...	5,829	5,018	6,528	17,375
Still Road	...	8,697	17,688	10,938	37,323
Stirling Road	...	2,549	6,248	2,141	10,938
Thomson Road	...	4,180	2,603	3,511	10,294
Tiong Bahru	...	7,502	21,006	14,651	43,159
Upper Serangoon Road	...	4,518	7,677	3,668	15,863
Total	...	<u>169,488</u>	<u>268,236</u>	<u>181,106</u>	<u>618,830</u>

Table 125

## Part-time Outpatient Dispensaries

		New Cases	Repeats	Total
Changi Point	...	2,451	1,646	4,097
Gulega Road	...	1,457	601	2,058
Kampong Batak	...	4,056	1,975	6,031
Pulau Brani	...	1,864	3,710	5,574
Pulau Tekong	...	2,771	6,846	9,617
Total	...	<u>12,599</u>	<u>14,778</u>	<u>27,377</u>

TRAVELLING DISPENSARIES

There are five travelling dispensaries. Each has a Hospital Assistant in charge and each dispensary does a specified route on a fixed item schedule. Attendances were as follows:

		New	Repeats	Total
Travelling Dispensary No. 1	...	21,326	19,691	41,175
Travelling Dispensary No. 2	...	21,632	10,713	36,857
Travelling Dispensary No. 3	...	20,788	13,866	36,798
Travelling Dispensary No. 4	...	14,242	19,598	38,011
Travelling Dispensary No. 5	...	19,917	10,429	31,300
Total	...	<u>97,905</u>	<u>74,297</u>	<u>184,141</u>

STAFF DISPENSARIES

There are five staff dispensaries which are for the treatment of staff in the Government service. Two of the clinics known as the Senior Officials' Clinic and the Junior Officials' Clinic are for the treatment of Government officers and members of their immediate families. The other three clinics are the former City Council staff dispensaries, and treatment is provided for members of the staff only. By arrangement the staff dispensaries also treat the staff of the Public Utilities Board and the Housing and Development Board.

Government officers may choose to attend at any other Government out-patient dispensary if this is convenient but they will be treated as members of the public although no charges will be made for such treatment. Government officers, of course, may be treated by their own private practitioners, in which case, they pay for the medical treatment on their own. Table 126 gave the record of attendances at the Staff Dispensaries:



Table 126  
STAFF DISPENSARIES

	NEW CASES			REPEATS			Injections and Dressings	Total
	Male	Female	Child	Male	Female	Child		
Alexandra Road	..	27,570	164	..	10,553	4	..	58,306
Jalan Berseh ..	..	45,968	..	..	21,974	..	..	112,586
Junior Officials'	..	3,453	1,449	1,000	13,566	3,340	2,368	34,483
Rochore House	..	22,875	1,492	..	8,730	642	..	49,237
Senior Officials'	..	2,195	2,110	921	4,205	3,485	1,319	16,299
Total ..	..	102,061	5,215	1,921	59,028	7,471	3,687	270,911

*Government Officials' Dispensaries*

The two dispensaries for Government officials are at the General Hospital. Besides providing treatment for Government officers and their families, the medical officers attached to them are responsible for conducting medical examinations for recruits into Government service, medical boards and inoculations for travel requirements and immunization against common diseases.

A record of their work is given in the following table:

		Recruits Examined	Medical Boards	Vaccinations and Inoculations
Senior Officials	...	975	32	2,206
Junior Officials	...	5,153		

*Staff Dispensaries for former City Council Employees*

There are three dispensaries:

- (1) The Rochore House Staff Dispensary;
- (2) Alexandra Staff Dispensary, and;
- (3) The Jalan Berseh Staff Dispensary.

The staff of the Public Utilities Board and the Housing and Development Board are treated in these dispensaries. For this service, the Boards pay respectively \$55,000 and \$11,000 a year to Government.

*Police Hospital and Clinic*

The Police Training School Clinic and Hospital are situated at the Police Training School, Thomson Road, and this provides medical services for the members of Police Force.

During the year, 17,181 outpatients attended the Clinic and 1,018 recruits were examined. There were 187 patients admitted to the Police Training School Hospital in 1964.

*Police Families Clinic*

The Police Family Clinic is situated at the Hill Street Police Quarters. The Staff Nurse in-charge of the Clinic visits the various Police Stations and gives advice to Police families and children who are having minor illness and sends more serious cases to the nearest outpatient dispensary or to General Hospital.

During the year, 27,017 outpatients attendances were recorded.

*Reformative Training Centre at Ulu Bedok*

During the period from January to July 1964, the inmates of Reformatory Centre, requiring medical attention were transferred to Changi Prison for treatment. After 1st August, 1964, the Medical Officer-in-charge Changi Prison and a male nurse visited the Centre daily to administer treatment to the inmates.

In May 1964, 300 inmates were inoculated against cholera.

A Dental Officer of the Mobile Unit visited the Centre fortnightly and treated an average of 10 inmates per visit.



## INSTITUTIONAL HOSPITALS

*Local Prison, 1964*

In the course of demolition of Outram Road Prison to make way for a Housing Development project, one ward of the Hospital, *G* Ward was closed. Patients were housed in one part of the old Prison Hospital, while parts of it were given over to administrative officers.

In September 1964, with the closure of *G* Ward, the services of the part-time medical officer were discontinued, so there remained one full time medical officer for Prison and Opium Treatment Centre. The staff now comprise one medical officer who is also medical officer i/c Opium Treatment Centre, one hospital assistant and seven male nurses. Other staff were recruited from prisoner-helpers.

The total number of prisoners admitted to Local Prison was 6,205 and the daily population was 670.8.

There were 638 admissions to hospital giving a ratio of Hospital admissions to Prison admissions of 10.3 per cent. The daily average bed occupancy was 44.8 per cent.

There were 238 admissions for drug addiction giving 37.3 per cent of admissions.

There were 88 cases of pulmonary tuberculosis, giving a rate of 1.4 per cent of the Prison population, and 13 cases of malaria, four of leprosy.

Of the 238 admissions for drug addiction there were 193 opium, 42 morphine, and three ganja addicts making respectively 81 per cent opium, 18 per cent morphine and one per cent ganja.

A total of 536 persons were admitted to Prison on charges of being drunk, constituting 8.6 per cent of the total prison admission.

Of the 238 drug addicts admitted however there were 36 with pulmonary tuberculosis and this gives a rate of 15.1 per cent. This bears out with the observation that pulmonary tuberculosis has a higher incidence in opium addicts, then in the general population.

The 13 cases of malaria during the year were all Indonesians.

The total number of outpatients was 11,916, comprising 657 New Cases, 11,259 referred cases with a daily average of 32.5 cases. With a daily bed occupancy of 44.8 and an average daily prison population of 670.8 the daily sickness rate was 11.5 per cent.

The Dental Surgeon treated 621 cases. The number of vagrants is increasing. Of 512 prisoners in the Local Prison on 31st December, 1964, 204 were vagrants, i.e. 39.5 per cent.

There were 31 deaths of prisoners and vagrants in the Prison Hospital and in other hospitals. 29 or 94 per cent of the deaths were of vagrants and 26 out of the 29 vagrants who died were 60 years and above.

There were no executions.



*Changi Convict Prison*

The Changi Prison Clinic and Hospital was staffed by a medical officer, three hospital assistants and three prison orderlies for the most part of last year. A new Prison Hospital block was completed last year and with the opening of the new block, four male nurses were posted to the Prison Hospital in November 1964.

A regular inspection of the Prison health and sanitation was maintained throughout the year.

The daily average of prisoners in the Prison was 1,090. The total number of outpatient attendances during the year was 32,305. A total of 241 patients were admitted into the Prison Hospital. The number of minor operations performed during the year was 416. The Dental Officer visited the Prison once a week and examined 2,086 cases in the year.

## OPIUM TREATMENT CENTRE

The Opium Treatment Centre, St. John's Island, established on 8th February, 1955, has since 8th August, 1963, become a hospital for the treatment and rehabilitation of opium addicts.

The staff consist of one full-time medical officer, who is also medical officer-in-charge Local Prison, one lay superintendent, three rehabilitation officers, two male nurses, clerical staff and a warder/attendant complement of 28.

The treatment of the addict is based upon the two principles of looking upon the addict as a patient to be treated medically and treating the whole patient.

Treatment is carried out in three phases — withdrawal, rehabilitation, and follow-up. The first phase and second phases take place on St. John's Island and take two weeks and three months respectively. The third phase is carried out by means of a follow-up clinic at Maxwell Road Outpatient Dispensary.

In 1964, a total of 285 persons (males) were admitted to the Opium Treatment Centre, comprising 214 volunteers and 71 convicted persons. There were 287 discharged from the Centre in 1964, comprising 183 volunteers and 104 convicted prisoners. Of the 183 volunteers, 138 completed their rehabilitation while 45 were discharged without completing treatment and rehabilitation, making 24.6 per cent.

Since 1963, when Opium Treatment Centre ceased to be a Prison Institution the number of volunteers has increased. There were 60 volunteers out of 189 admissions in 1963 making 32 per cent and in 1964 there were 214 volunteers out of 285 admissions, giving 75 per cent.

*Opium Treatment Centre Advisory Committee*

The Opium Treatment Centre Advisory Committee continued its weekly meetings and interviewed a total of 285 persons during the year.

*Opium Treatment Centre Follow-up Clinic*

This is a special clinic which is attached to the Opium Treatment Centre. It is now at the Maxwell Road Outpatient Dispensary. The Medical Officer-in-charge Opium Treatment Centre mans the sessions on Friday afternoons. Here volunteers who have applied for admission to the Opium Treatment Centre are registered and interviewed by rehabilitation officers, and undergo medical examination and preparation prior to being admitted to Opium Treatment Centre.

Here also patients who have been discharged from the Opium Treatment Centre are followed up and treatment and other assistance, is given by Medical Officer and Rehabilitation Officers.

A total of 547 visits were made to the Clinic; of these 273 were from volunteers being seen prior to admission to St. John's and 274 were follow-up visits.

## DISTRICT NURSING SERVICE

The District Nursing Service has continued to give follow-up and Nursing care to patients in their own homes and help in their rehabilitation. The patients referred for such care are from General Hospital and Outpatient Dispensaries. The total number of new patients received during the year was 647.

Total number of nursing visits paid to the homes was 11,327. Total number of supervisory visits made was 664. The staff comprised of one Sister and six staff nurses.

The District Nurses are attached to the following six centres:

- (1) Pegu Road Outpatient Dispensary;
- (2) Kallang Outpatient Dispensary;
- (3) Jalan Kayu Outpatient Dispensary;
- (4) Bukit Panjang Outpatient Dispensary;
- (5) Queenstown Outpatient Dispensary;
- (6) General Hospital.

Table 127  
INSTITUTIONAL HOSPITALS

	NEW CASES			REPEATS			Injections and Dressings	Total
	Male	Female	Child	Male	Female	Child		
Police Families' Clinic .. ..	623	607	542	8,936	8,881	7,859	122	27,570
Changi Prison Hospital and Reformatory Training Centre .. ..	7,056	..	..	25,249	..	..	8,636	40,941
Local Prison Hospital .. ..	570	87	..	9,709	1,550	..	7,190	19,106
Police Training School Hospital .. ..	3,905	1,042	2,015	13,604	7,379	14,411	21,642	63,998
Changi Prison Staff Hospital .. ..	182	101	250	607	208	752	832	2,932
Total ..	12,336	1,837	2,807	58,105	18,018	23,022	38,422	154,547



## 25. DEPARTMENT OF RADIOLOGY

TABLE 128 shows that the total number of cases X-rayed in 1964 was 279,130 compared with 286,166 of 1963, i.e., a slight overall decrease of 7,036 cases or 2.5 per cent. This decrease could be accounted for by the 1964 July and September disturbances.

Table 128

NUMBER OF CASES RADIOGRAPHED IN THE VARIOUS HOSPITALS  
AND INSTITUTIONS (DIAGNOSTIC) IN 1964,  
COMPARED WITH 1963

	1964	1963	Percent Increase	Percent Decrease
General Hospital (Appendix A and B) ...	92,596	106,856	—	14.8
Tan Tock Seng Hospital (Appendix C) ...	83,144	85,423	—	2.6
Kandang Kerbau Hospital (Appendix D) ...	6,858	7,226	—	5
Woodbridge Hospital (Appendix E) ...	3,387	3,530	—	4
Institute of Health (for chest only) ...	18,651	18,495	2.6	—
T.B. Control Unit (for chest only) ...	74,076	68,636	14.6	—
Thomson Road Hospital (Appendix G)	418	—	N.A.	N.A.
	<hr/> 279,130 <hr/>	<hr/> 286,166 <hr/>	<hr/> Overall decrease of 2.5% <hr/>	

### DIAGNOSTIC

*Radiologists.*—Dr. J. C. K. Yin was appointed as Radiologist, General Hospital, Grade G, from January, 1964.

Dr. Oon Chong Lin was appointed Senior Registrar from March, 1964.

Two medical officers, Dr. Boey Hong Khim and Dr. Kho Kwang Mui joined as Trainees in February and October, 1964, respectively.

Dr. Yu Sheng Fong obtained his D.M.R.D. on 22nd October, 1964.

Dr. Boey left for the United Kingdom in September, 1964, on a Colombo Plan Fellowship for a course leading to the D.M.R.D.

*Radiographers.*—The staffing situation improved somewhat in 1964, but there were insufficient radiographers available locally to fill all posts.

*School of Radiography.*—Two officials of the Society of Radiographers, London, namely, Messrs. W. J. Ashworth and E. R. Hutchinson, who visited Kuala Lumpur in April, 1964, were invited by the Singapore Government for a three-day inspection of our School of Radiography from 3rd to 5th May. These two officials also visited the X-ray Departments of various hospitals and were greatly impressed by our set-up and facilities. The new School of Radiography building was considered by Mr. Ashworth a model school.

Following the return of these two officials to London, the Council of the Society of Radiographers agreed that their official Adviser/Tutor in Radiography would need to spend only six months supervision instead of the usual

twelve before any overseas School of Radiography could be recognised. On this information the Singapore Government formally approached the Colombo Plan authorities for aid in securing the services of an U.K. Adviser/Tutor in Radiography for a period of six months from January–June, 1965.

Regular class for Pupil Radiographers were conducted through 1964. Ten new pupil radiographers were recruited in October, the second year of the School since its inception in October, 1963.

Part I Examination for the first batch of pupil radiographers was to have been held in October, 1964, but was postponed till April, 1965, pending recognition by the Society of Radiographers.

Teaching was done by the W.H.O. Lecturer in Radiography, Mr. D. R. E. Ernborg, the Senior Radiologist, the Superintendent Radiographer and the Hospital Physicist.

Acknowledgement is given here for lectures and demonstration in nursing given by the School of Nursing through the courtesy of the Principal Matron and Sister Tutor, and for anatomy and histology through the courtesy of the Professor of Anatomy, University of Singapore.

*Cardiovascular Laboratory.*—Specialised cardiovascular examinations based on cardiac catheterisation were begun with the arrival of Professor S. B. Roy, W.H.O. Consultant Cardiologist, in February 1964. He remained till 11th August, 1964, and helped to train many physicians. 248 cardiac catheterisations were performed during Professor Roy's brief stay in Singapore.

*W.H.O. Multiple Seminar on Radiological Health.*—A highlight of the year was a two-day Multiple Seminar on Radiological Health held in Singapore on 27th and 28th October, 1964. This was sponsored by the World Health Organisation, and with delegates coming from all parts of Malaysia, as well as from Hongkong, Philippines and South Vietnam.

The Seminar was declared open by Mr. Yong Nyuk Lin, Minister for Health.

The W.H.O. experts consisted of Professor R. H. Chamberlain, Dr. S. B. Osborne and Dr. R. C. Dobson.

Lectures were interspersed by a film show and a visit to the Department of Radiology of the General Hospital. Discussions of a fruitful nature followed the lecture sessions. The Seminar was a great success and undoubtedly delegates benefited greatly from it.

#### THERAPEUTIC

The total number of cases treated in the General Hospital was 815 for 1964, compared with 780 in 1963, i.e. an increase of 13 per cent. Of these, malignant cases numbered 738 for 1964 as against 647 for 1963, i.e. an increase of 14 per cent. It is of interest to note that 191 cases of nasopharyngeal carcinoma were treated in 1964, compared with 151 in 1963, representing an increase of 26.5 per cent.

For the Kandang Kerbau Maternity Hospital, 214 radium insertions were performed in 1964 compared with 137 in 1963, i.e. an increase of 77 per cent.



The present stock of radium available in the Kandang Kerbau Maternity Hospital is already inadequate for routine needs.

*New Radiotherapy Department.*—The official report of Professor Ralston Paterson, W.H.O. Consultant in Radiotherapy, was released in 1963. Professor Paterson favoured the construction of a new radiotherapy block in the open stretch of ground between the Chemistry Building and Housemen's Quarters, within the compound of the General Hospital. This site is eminently suitable because it has a natural embankment which can be economically employed to shield off penetrating radiation. Another advantage is that this site is near to surgical, medical and diagnostic X-ray Departments. But only a token vote of \$10 was provided in the 1965 Estimates for the new Radiotherapy Department.

The awareness of the public to the problem of cancer was in great part due to the efforts of the Minister for Health. Following an opening address in a one-week Symposium devoted to Cancer of the Nasopharynx sponsored by the U.I.C.C. in August, 1964, a Singapore Cancer Society was established within four months in December, 1964.

*Staff.*—Dr. Chia Kim Boon, Radiotherapist, left in November, 1964, on a six-month W.H.O. Fellowship which would carry him to well known radiotherapy centres in the U.K. in the Continent and in North America.

Dr. Chia's mission has two objectives: one, to enable him to pick up the latest methods in the treatment of malignant disease, with special reference to the use of radioisotopes, and the other to enable him to gather the best of what is found in up-to-date radiotherapy centres and equipment and to select what are most suitable for the needs of our new Radiotherapy Department.

Dr. Tan Ban Cheng was appointed Senior Registrar, Department of Radiotherapy from March, 1964.

*Other X-Ray Departments.*—The new wing of the Thomson Road Hospital was completed early 1964, following which new up-to-date X-ray machines were installed. These included three large diagnostic units, a skull table and one tomographic attachment. A fully automatic processing unit was also installed, the first of its kind in Singapore. Dark room equipment also included a continuous X-ray film drier, etc.

Routine day radiographic service was started in December, 1964. The activities of the X-ray Department would be gradually stepped-up according to the expanding needs of the Thomson Road Hospital.

Planning and equipment for the new X-ray Department located in the Thoracic Wing of the Tan Tock Seng Hospital were brought up-to-date in 1964.

A small X-ray service was made available in the 'E' (Casualty) Unit of the General Hospital from 24th August, 1964. A borrowed Mobile X-ray Unit was installed for X-rays of limbs, with a radiographer on duty there during office and evening hours only.



*Publications*

Some Sagittal Measurements of the Neck in Normal Adults. *British Journal of Radiology*, September, 1964.

A New Method of Pinael Localization. *American Journal of Roentgenology*, December, 1964.

Ureteric Irregularity due to Collateral Vessels in Renal-artery Stenosis, by H. O. Wong and K. W. Chow. *British Medical Journal*, 15th February, 1964, Vol. I, page 418.

X-Pelvimetry. *The Bulletin of the Kandang Kerbau Hospital*, Singapore. 3 : 27-35. March, 1964.

SUMMARY OF WORK DONE IN THE RADIOTHERAPEUTIC IN 1964

	1963	1964
<i>Deep X-Ray Therapy</i>		
Malignant Cases ... ..	647	738
Non Malignant Cases ... ..	8	17
Superficial X-Ray Therapy ... ..	61	48
Radium Cases: Treated in General Hospital ...	4	12
Total Number of Radium Insertion performed at Kandang Kerbau Hospital ... ..		214

## 26. BLOOD TRANSFUSION SERVICE

### GENERAL

THE Blood Transfusion Service based at the Centre at the General Hospital has continued to serve all hospitals in Singapore.

The demand for blood transfusion in Singapore's hospitals has continued to increase. This increased demand was to a certain extent met by an increase in the number of donations received, though there were still occasions during the year when urgent operations have had to be postponed due to the inavailability of blood of one or other group.

The work of the Department has increased not only in volume, but also in scope and a number of new techniques and investigations previously not available have been included.

Donor recruitment has continued on similar lines as in the past with emphasis firstly on persuading the locally domiciled population to come forward as donors. Secondly, a greater effort has been made to persuade the relatives and friends of patients who have received or will be receiving transfusions to volunteer as donors.

A Lucky Donor of the Month Draw was introduced as an incentive to the public to come forward and donate blood.

*Staff.*—The head of the Department is Dr. Kwa Soon Bee.

The establishment of the Department has remained the same with two medical officers, one supervisor, one donor organiser, 13 laboratory technicians, four assistant nurses, three clerical assistants, 11 medical and health servants, and three drivers. Two medical officers have been seconded from the Ministry of Health to work in the Department. One medical officer is at present in U.K. undergoing a course of study in Clinical Hæmatology and Blood Transfusion organisation.

*Donations received and transfusions given.*—During the year 17,379 blood donations were received by the Blood Transfusion Service. This represents an increase of 11.06 per cent over the previous year (see Table 129).

During the same period 16,081 transfusions were given to patients in Hospitals in Singapore. This represents an increase of 7.75 per cent over the previous year. The proportion donated and used by the different racial groups has remained the same during the year (see Table 130).

The distribution of blood to the various hospitals in Singapore is given in Table 131. It will be noted that 9,910 or 61.7 per cent of all transfusions given were given at the General Hospital and that 4,224 or 26.2 per cent were given at Kangas Kerbau Maternity Hospital.

A total of 1,110 (6.9 per cent) transfusions were given in private hospitals during the year,



*Relative Donors.*—In spite of an increased effort by the doctors and nursing staff, it was possible to obtain a total of 2,226 (2,681 in 1964) donations from relatives and friends of patients. This represents only 12.78 per cent of all donations received.

*Laboratory Service.*—The Blood Transfusion Laboratory has continued to provide a 24 hour service for all hospitals in Singapore. The large increase in volume of work undertaken has put a heavy strain on the existing staff whose establishment of 13 laboratory technicians has not been increased since 1955 although the volume of work has increased by about 100 per cent.

During the year 38,549 (35,438 in 1963) compatibility tests were carried out.

In addition 2,761 special investigations into various Hæmotological disorders like Neonatal Jaundice, hæmolytic anæmia, antenatal screening of mothers for abnormal antibodies, and cases with a hæmorrhagic diathesis were carried out.

*Research Projects.*—Studies into the serum iron values of the donors' population is still continuing. In addition the study of the congenital hæmorrhagic disorders is still in progress. A study into the causes of anæmia seen in the maternity hospital was started during the year.

*Blood Fractions.*—During the year a total of 1,254 plasma transfusions were given, 235 of which were used by patients in Kandang Kerbau Maternity Hospital.

The use of fresh frozen plasma which is a rich source of anti-hæmophilic globulin needed for the treatment of cases of hæmophilia has continued.

In addition, platelet rich blood and platelet concentrates prepared in plastic disposable equipment has continued on a small scale.

*Production of Infusion Apparatus.*—During the year a total of 19,736 (18,771 in 1963) blood giving sets and 20,003 (19,423 in 1963) saline giving sets were assembled and sterilised for distribution to all the hospitals in Singapore.

*Mobile Session.*—During the year, a total of 139 (150 in 1963) outdoor sessions were held at various police, military, and work brigade camps, factories and offices, educational institutions and the prisons. A total of 6,611 donations were received at these sessions representing 38.04 per cent of the year's total donations received.

*Publicity and Propaganda.*—This has continued along the same lines as in the past. There has been an increased use of Television and radio during the past year, to publicise the work of the department. A number of programmes and news items in both English and Mandarin were shown on Television during the year. Spot announcements have continued on Television in all four languages daily.

In addition, lantern slides have continued to be shown at all major Chinese and English cinema theatres in the State throughout the year.



A Lucky Donor of the Month Draw in which donors were issued with tickets which were to be drawn for prizes at the end of each month was organised. The main prizes of \$1,000 cash and a Single Return Air ticket to Hong Kong were donated by the Singapore Turf Club and Malaysian Airways Ltd. In addition a large number of commercial organisations made donations of consolation prizes for the Draw. The Singapore Blood Transfusion Service would like to place a record its appreciation and thanks to these organisations for their valuable donations.

A six-week publicity campaign was launched in December 1964. This was aimed at bringing the attention of the public to the urgent need to support the blood bank.

A Malaysia wide poster design competition was also organised. This publicity campaign ended with a Gift of Life Exhibition at the Victoria Memorial Hall in January 1965.

During the year, a Medal Presentation Ceremony was held which the Political Secretary to the Ministry of Health, Mr. Chor Yeok Eng presented awards to a total of 158 regular donors.

#### *Donations from Commercial Firms*

The Service acknowledges with thanks the donations of various refreshments and cigarettes, etc. throughout the year from the following organisations:

Fraser & Neave Ltd. — Beer and Aerated Waters.  
 Diethelm & Co. Ltd. — Barlova.  
 Sime Darby (Singapore) Ltd. — Guinness Stout.  
 Singapore Tobacco Co. Ltd. — Player's Cigarettes.  
 Nestle's Products (Malaya) Ltd. — Milo, Nescafe and Milkmaid Milk.  
 Borneo Co. Ltd. — Bovril.  
 A. Wander Ltd. — Ovaltine.  
 Vernat Eastern Agencies Ltd. — Horlicks.  
 Singapore Cold Storage Ltd. — Still-Orange and Grape-Fruit.  
 Guthrie & Co. Ltd. — Bulldog Stout.  
 Rothmans of Pall Mall — Rothman and Consulate Cigarettes.

Table 129

#### DONATIONS RECEIVED AND TRANSFUSIONS GIVEN — 1960-64

		Total Donations Received	Percentage Increase Over Previous Year	Total Transfusions Given	Percentage Increase Over Previous Year
1960	...	12,874	11	12,595	11.5
1961	...	13,189	2.4	12,913	2.5
1962	..	14,183	7.5	13,775	6.7
1963	...	15,649	10.3	14,925	8.3
1964	...	17,379	11.06	16,081	7.75

Table 130

ANALYSIS OF DONATIONS RECEIVED AND TRANSFUSIONS  
GIVEN BY RACIAL GROUPS — 1964

		Donations Received	Percentage	Transfusions Given	Percentage
Chinese	...	6,113	35	12,213	75.95
Malay	...	4,818	28	1,872	11.64
Indian	...	2,018	12	1,369	8.52
Europeans	...	3,404	19	358	2.22
Eurasian	...	848	5	144	.90
Others	...	178	1	125	.77
		<u>17,379</u>	<u>100</u>	<u>16,081</u>	<u>100</u>

Table 131

ANALYSIS OF DISTRIBUTION TO HOSPITALS

			Transfusions Given	Percentage
General Hospital	...	...	9,910	61.7
Kandang Kerbau Maternity Hospital			4,224	26.2
Other Government Hospitals	...	...	837	5.2
Private Hospitals	...	...	1,110	6.0
			<u>16,081</u>	<u>100</u>



## SECTION IV

### . OTHER SPECIAL DEPARTMENTS





## 27. DENTAL HEALTH

THE public dental services were fully maintained during 1964 as the staffing situation was good throughout the year. The Head of the Dental Branch, Mr. Wong Mook Qui, controlled an establishment of 58 dental surgeons, 76 school dental nurses, 26 dental technicians and 151 other staff. There were 51 dental clinics in operation by the end of the year providing dental care to school-children, to mothers and infants attending the Maternal and Child Health Centres, to hospital patients and out-patients, and other groups of the population.

### SCHOOLS DIVISION

The provision of adequate dental attention for Singapore school-children continued to be a serious problem as the school population increased to over 450,000 last year. There were about 358,000 primary school pupils and 95 per cent of these children on first entering school needed dental treatment, but only very few of them were actually receiving dental care from their own private dentists. Their dental needs were great, and it was therefore necessary to devote over half of the resources of the department to run the School Dental Service.

During 1964 six new dental clinics were established in certain primary schools bringing the total number of school clinics to 34, including 2 large School Dental Centres. Near the end of the year, the construction of 10 new dental clinics in certain existing primary schools was completed. Accommodation for a dental clinic was also provided in each of six new primary schools opened by the Ministry of Education during the year. Therefore, a total of 16 new clinics was made available for opening early in 1965. The picture is one of steady expansion during the last 5 years and promising for the future.

In order to provide adequate dental staff to man the expanded School Dental Service, a Dental Nurses' Training School had been established early in 1962 at the Institute of Health to train ancillary dental personnel. This School provided a two-year course and planned to graduate 20 school dental nurses a year, and the first batch of 19 dental nurses duly graduated in January 1964. These trained dental nurses had since been posted at various school dental clinics. They worked under the supervision of Dental Officers and were found to be effective in providing routine conservative dental treatment to school-children. The system whereby a number of dental nurses worked under the close supervision of a Dental Officer was being developed carefully and should become standardised and adopted generally in the School Dental Service within the next two years. The returns of work for the year showed a substantial increase over that of 1963, and the total number of patient-attendances reached a new record of 151,112. Dental extractions totalled 98,594, and 69,934 permanent dental filling had been done for the school-children beside other dental work.



## HOSPITALS DIVISION

The Hospitals Division comprised a large dental clinic at the General Hospital and 3 other dental clinics located in the Tan Tock Seng Hospital, the Woodbridge Hospital and the Trafalgar Home. During 1964 a new dental clinic was being completed at the Thomson Road Hospital, and a similar clinic was also under construction in the new Thoracic Unit Block of the Tan Tock Seng Hospital. Both clinics should be in operation in the following year. Inmates of the St. Andrew's Orthopædic Hospital and the Red Cross Home for crippled children continued to receive dental attention from a mobile dental clinic which visited these institutions regularly.

The dental clinic at the General Hospital continued to provide treatment to hospital patients and out-patients. Professor J. A. Jansen, Head of the Department of Dentistry of the University of Singapore, was in charge of this clinic, and he had under him Government dental staff as well as University personnel working in the clinic. These staff provided a wide range of dental treatment, including specialist treatment, to patients attending this clinic. The work at this department was well maintained during the year and the total number of patient-attendances was 113,850. This was slightly lower than the figure recorded in 1963, but the decrease was accounted for by the decreased attendances of patients during the July and September civil commotions. This clinic functioned throughout the period of the civil commotions, and afforded prompt treatment to a small number of casualties who had sustained dental and oral injuries. Towards the end of the year, the Senior Dental Surgeon, Mr. George Paul, resigned from the service and left for the United Kingdom. He was replaced by Mr. Lim Kheng Ann who took over in an acting capacity.

The chronic sick in the Tan Tock Seng Hospital, the Woodbridge Hospital and Trafalgar Home were given attention by a Dental Officer at the dental clinics located in these institutions. The work done showed a slight increase over that of the previous year.

## MATERNAL AND CHILD HEALTH DIVISION

Pregnant and nursing mothers and their young children of pre-school age received dental treatment at 7 dental clinics located in the following centres:

Prinsep Street M. & C.H. Centre  
Bukit Timah M. & C.H. Centre  
Ama Keng M. & C.H. Centre  
Mandai M. & C.H. Centre  
Yio Chu Kang M. & C.H. Centre  
Kampong Batak M. & C.H. Centre  
Buona Vista M. & C.H. Centre

Dental Officers at these clinics attended to patients referred by the above Centres and other M. & C.H. Centres in Singapore. Dental treatment at these clinics was provided free of charge as in the case of medical services which

were being provided by Government to mothers and infants at M. & C.H. Centres. The work of this division was satisfactory, and the total patient-attendances of these clinics was 24,240. The number of permanent dental fillings done was 3,482, and 20,510 teeth were extracted. The number of dentures issued was 1,549.

#### MISCELLANEOUS DENTAL SERVICES

For the police rank and file in Singapore, dental care was provided by one Dental Officer at the dental clinic located at the Central Police Station. This Dental Officer also visited Outram and Changi Prisons weekly to attend to prisoners and detainees who had dental complaints.

Dental treatment was provided by mobile dental clinics to inmates of several institutions and charitable homes, including the Blind School, Cheshire Home, the Spastic Children's Association Centre, Boys' Town, and the Lee Kuo Chuan Nursery. A mobile dental clinic regularly attended to inmates at Gimson School, Mt. Emily Girls' Home and the Girls' Home-Craft Centre.

Young children attending various children's centres in Singapore were provided with dental care at two clinics sited at the Geylang Community Centre and the Siglap Community Centre. It was noted during the year that the number of such children was gradually decreasing owing to the fact that more of these children had found places in the regular schools.

#### *Preventive Dentistry*

Nearly half of the population in Singapore consists of children and adolescents, and among these young people dental caries is prevalent. In order to reduce the incidence of dental decay among this young population, fluoridation of the entire municipal water supply in Singapore was instituted in 1958. It came into its 7th year of operation in 1964, and promising results had been recorded by means of an annual dental survey carried out among school children.

During the year, several dental exhibitions were held in conjunction with the official openings of several new primary schools, each of which having provision for its own dental clinic. These exhibitions helped to propagate dental health knowledge among school children and their parents. Dental Officers and school dental nurses were making a better effort to impart dental health education as well as providing dental treatment to their patients.

#### TRAINING OF STAFF

During the year there were 44 student dental nurses under training in the Dental Nurses' Training School at the Institute of Health. The first batch of 19 dental nurses graduated from the School in January, followed by an intake of 23 new trainees in June. Among the student dental nurses, two girls came from Thailand under the auspices of the Colombo Plan and two girls were sent by the Sarawak Government.



Two small batches of student dental assistants were under departmental training during the year. This was done largely on the basis of 'in-service' training.

A group of 7 probationer dental technicians was undergoing the second year of training in the department. They were taking a 3-year training course in dental mechanics in the Government Dental Laboratory at the Institute of Health.

One Dental Officer, Mr. Chua Sui Yeow, who left for the United Kingdom for higher studies under a departmental fellowship in the previous year, succeeded in obtaining the F.D.S.R.C.S. (England) and the F.D.S.R.C.S. (Edin.). He returned to Singapore in August, and had resumed duty in the Oral Surgery Unit of the General Hospital Dental Clinic.

During the year, two other Dental Officers left for higher studies in the United Kingdom, namely Mr. Yeo Seng Sit and Mr. Wong Hee Deong who left in August and September respectively. Mr. Wong was to undergo a course leading to the D.P.D. (St. Andrew's), and Mr. Yeo intended to study for the Fellowship in Dental Surgery.

#### DENTAL BOARD

The Inspecting Officer, Dental Board, had reported that by the end of 1964 there were 334 registered dentists practising in Singapore, of which 115 were fully qualified dental surgeons. Of the qualified dentists, 55 were in Government service, 14 were teaching in the Dental School of the University of Singapore, and 46 were in private practice. There was an increase of 6 qualified dentists in the Dental Register.

During the year, the Inspecting Officer carried out a total of 352 inspections on the premises of Division II dentists, and 21 warning notices had been issued to certain dentists who were found to be practising dentistry under unsatisfactory conditions.

#### ANNUAL RETURNS OF WORK IN GOVERNMENT DENTAL CLINICS

Table 132 showed the return work in respect of all Government dental clinics.

TABLE 132  
DENTAL SERVICES, SINGAPORE  
RETURN OF WORK  
Period Covered 1964

Clinic

	PATIENTS SEEN				TREATMENT GIVEN										PATIENTS	
	NEW CASES			Total attendances	FILLINGS			EXTRACTIONS		Scalings (per visit)	Dressings (per visit)	DENTURES INSERTED		Other treatment		
	Examined	Requiring treatment	Refusing treatment		Re-examined	Silver Amalgam	Silicate	Other	Deciduous teeth			Permanent teeth				
<i>Schools Division</i>																
School Dental Clinic, Institute of Health ..	11,954	11,917	55	..	31,187	4,694	1,356	2,819	16,406	12,190	370	670	342	3	1,350	517
School Dental Centre, Pegu Road ..	2,016	2,016	3	499	28,576	16,487	1,218	5,659	8,969	3,506	2,567	542	116	..	2,060	2,421
Dental Nurses' Training School ..	905	905	..	615	12,154	6,895	343	4,652	1,496	152	2,472	320	..	..	1,052	1,143
Dental Nurses' Clinics ..	1,335	1,237	101	4,152	17,228	6,792	502	1,660	4,808	794	3,539	1	..	..	903	3,433
Mobile Dental Clinics ..	3,712	3,640	92	1,986	9,235	2,360	174	1,534	4,563	1,932	297	67	2	..	278	987
Tanjong Katong Girls' School Dental Clinics ..	919	905	44	1,486	7,543	4,712	689	1,430	2,130	557	808	58	66	2	857	1,070
Labrador School Dental Clinic ..	523	511	8	103	2,859	1,358	89	402	1,376	204	125	..	5	..	58	307
Kaki Bukit School Dental Clinic ..	1,516	1,513	2	2,485	4,002	902	207	395	2,644	545	599	109	38	..	330	333
Mattar (East) School Dental Clinic ..	1,262	1,239	10	1,025	2,406	1,363	242	665	2,509	826	358	36	54	..	703	193
Telok Kurau (West) School Dental Clinic ..	419	417	88	..	1,567	563	17	213	971	73	22	1	4	..	28	166
Guillemard School Dental Clinic ..	876	876	52	..	2,196	680	13	282	1,188	289	20	2	1	..	41	187
Geylang Community Centre Dental Clinic ..	501	501	..	19	1,671	727	52	237	1,711	227	129	5	7	4	38	285
<i>Carried forward ..</i>	25,938	25,677	455	12,370	120,624	47,533	4,902	19,948	48,771	21,295	11,306	1,810	635	9	7,698	11,042

Notes:

TABLE 132—*contd.*  
DENTAL SERVICES, SINGAPORE  
RETURN OF WORK  
Period Covered 1964

Period Covered 1964																Clinic
	PATIENTS SEEN				TREATMENT GIVEN								PATIENTS			
	NEW CASES			Re-examined	Total attendances	FILLINGS			EXTRACTIONS		Scalings (per visit)	Dressings (per visit)	DENTURES INSERTED		Other treatment	Treatment completed
	Examined	Requiring treatment	Refusing treatment			Silver Amalgam	Silicate	Other	Deciduous teeth	Permanent teeth			Partial	Full		
<i>Schools Division</i>																
<i>Brought forward</i> ..																
Bedok Boys' School Dental Clinic	428	428	..	3	2,114	1,609	122	382	1,349	286	319	..	6	..	16	353
Siglap Community Centre Dental Clinic	616	602	..	33	1,880	441	21	438	2,256	380	71	3	6	..	11	62
Aroozoo Avenue School Dental Clinic	374	353	38	18	1,259	783	51	441	1,364	96	87	9	1	..	5	126
Telok Ayer School Dental Clinic	587	587	12	..	1,938	836	165	309	604	293	185	48	5	..	2	174
Hua Yi School Dental Clinic	4	4	..	..	1,151	744	4	193	639	51	101	..	..	..	60	55
Selegie School Dental Clinic	295	295	5	36	3,181	2,552	78	519	1,176	156	425	92	7	..	348	338
Balestier Hill School Dental Clinic	346	346	25	183	2,187	1,424	26	167	1,686	225	143	32	..	..	14	165
Kim Keat School Dental Clinic	656	656	73	186	2,016	1,082	16	160	1,582	177	101	21	..	..	10	116
Cambridge School Dental Clinic	153	150	24	66	1,232	872	38	269	733	81	105	..	5	..	92	142
Bukit Ho Swee English School Dental Clinic	522	522	15	..	1,513	166	3	352	1,039	173	9	1	2	..	47	49
Bukit Ho Swee Chinese School Dental Clinic	207	207	..	..	1,028	967	4	269	569	..	201	..	..	..	80	44
Jalan Kembangan School Dental Clinic	406	396	23	1,546	1,952	1,941	27	1,299	1,079	40	315	26	..	..	191	190
<i>Carried forward</i> ..																
	30,532	30,223	670	14,441	142,075	60,950	5,457	24,746	62,847	23,253	13,368	2,042	667	9	8,574	12,856

Notes:



TABLE 132—*contd.*

DENTAL SERVICES, SINGAPORE

RETURN OF WORK

Period Covered 1964

Clinic

	PATIENTS SEEN				TREATMENT GIVEN										PATIENTS						
	NEW CASES				Total attendances	Re-examined	Refusing treatment	Requiring treatment	Examined	FILLINGS			EXTRACTIONS			Scalings (per visit)	Dressings (per visit)	DENTURES INSERTED		Other treatment	
	Refusing treatment	Requiring treatment	Examined	Silver Amalgam						Silicate	Other	Deciduous teeth	Permanent teeth	Partial				Full			
<hr/>																					
<i>Schools Division</i>																					
<i>Brought forward</i> ..																					
Tanjong Rhu School Dental Clinic	253	253	1	300	47	58	16	153	5	..	..	..	..	..	..	1	..				
Alexandra Hill School Dental Clinic	269	269	28	969	700	247	108	657	67	10	67	2	..	..	..	..	94				
River Valley School Dental Clinic	951	951	66	3,799	2,029	1,369	773	1,680	229	42	773	359	8	1	..	25	169				
Bukit Panjang O.P.D. Dental Clinic (for children only)	1,922	1,922	8	9,969	187	1,123	786	4,630	5,073	678	786	260	470	144	27	716	498				
<i>Hospitals Division</i>																					
Dental Clinic, General Hospital	33,194	33,194	..	113,850	80,656	5,292	1,104	36,177	43,109	1,583	1,104	..	25,184	2,499	972	4,268	..				
Dental Clinic, Tan Tock Seng Hospital	806	806	19	2,283	1,477	284	4	50	2,419	85	4	72	101	20	85	486	278				
Dental Clinic, Woodbridge Hospital	823	823	27	1,929	1,096	156	..	26	1,589	26	..	15	39	26	11	677	268				
Dental Clinic, Trafalgar Home	360	360	..	1,381	1,021	312	..	53	750	64	..	34	57	90	82	493	140				
<i>Carried forward</i> ..																					
																		1,186	3,447	15,240	14,303

Notes:

TABLE 132—contd.  
DENTAL SERVICES, SINGAPORE  
RETURN OF WORK  
Period Covered 1964

Period Covered 1964																		Clinic
	PATIENTS SEEN						TREATMENT GIVEN										PATIENTS	
	NEW CASES			Total attendances	Re-examined	Refusing treatment	FILLINGS			EXTRACTIONS		Scalings (per visit)	Dressings (per visit)	DENTURES INSERTED		Other treatment	Treatment completed	
	Examined	Requiring treatment	Refusing treatment				Silver Amalgam	Silicate	Other	Deciduous teeth	Permanent teeth			Partial	Full			
M. and C.H. Division																		
Brought forward ..	69,110	68,801	819	276,555	101,654	819	69,791	7,945	27,537	106,273	76,494	14,110	27,901	3,447	1,186	15,240	14,303	
Bukit Timah M. and C.H.C.	1,236	1,236	..	6,239	..	..	891	187	135	2,066	3,508	179	147	158	223	1,008	219	
Ama Keng M. and C.H.C.	279	279	..	1,314	..	..	107	34	21	686	952	25	13	..	..	3	..	
Buona Vista M. and C.H.C.	508	508	23	1,889	1,381	23	111	42	55	1,003	910	9	5	100	50	290	74	
Yio Chu Kang M. and C.H.C.	508	508	..	1,735	1,227	..	152	43	161	821	1,001	19	13	..	..	30	..	
Mandai M. and C.H.C.	802	802	..	3,670	2,868	..	356	41	265	1,376	1,947	48	8	140	124	667	228	
Jalan Eunus M. and C.H.C.	809	809	2	4,696	52	2	345	55	238	1,157	2,276	117	186	194	146	973	134	
Prinsep Street M. and C.H.C.	708	708	..	4,697	3,989	..	807	311	123	8	2,799	203	107	270	144	910	236	
Miscellaneous																		
Orthodontic Unit, Institute of Health ..	434	434	..	4,944	4,510	..	151	86	72	320	3,856	45	257	9	..	485	58	
Carried forward ..	74,394	74,085	844	305,739	115,681	844	72,711	8,744	28,607	113,710	93,743	14,755	28,629	4,318	1,873	19,606	15,252	

Notes:

TABLE 132—*contd.*  
DENTAL SERVICES, SINGAPORE  
RETURN OF WORK  
Period Covered 1964

Period Covered 1964																	Clinic																	
PATIENTS SEEN																	TREATMENT GIVEN										PATIENTS							
NEW CASES																	FILLINGS			EXTRACTIONS		Dressings (per visit)	DENTURES INSERTED		Other treatment	Treatment completed								
Examined	Requiring treatment	Refusing treatment	Re-examined	Total attendances			Silver Amalgam	Silicate	Other	Deciduous teeth	Permanent teeth	Scalings (per visit)	Partial	Full																				
—																																		
Miscellaneous																																		
Brought forward ..																	74,394	74,085	844	115,681	305,739	72,711	8,744	28,607	113,710	93,743	14,755	28,629	4,318	1,873	19,606	15,252		
Police Dental Clinic ..																	834	834	..	4,126	4,960	1,101	199	5	..	2,662	31	342	120	8	321	45		
Changi Prison Dental Clinic																	1,791	1,791	..	..	1,791	..	..	..	..	1,181	..	..	..	..	..	..	..	..
Outram Prison Dental Clinic																	621	621	..	..	621	..	..	..	..	463	..	..	..	..	..	..	..	..
St. John's Island Dental Clinic ..																	91	91	..	..	234	..	..	..	1	239	..	..	..	..	..	1	..	..
Pulau Bukom Dental Clinic																	249	248	6	9	1,244	487	26	116	654	156	49	..	1	..	48	114		
Pulau Sudong Dental Clinic																	12	12	..	..	144	62	..	14	98	27	2	..	..	..	..	4		
Grand Total ..																	77,992	77,682	850	119,816	314,733	74,361	8,969	28,742	114,463	98,471	14,837	28,979	4,438	1,881	19,975	15,415		



## 28. TUBERCULOSIS CONTROL UNIT

### STAFF

DR. Wong Hin Sun was the Assistant Director of Medical Services (Tuberculosis). For the period 5th November, 1964 to 11th November, 1964 he was at Kuala Lumpur as a participant in the W.H.O. Inter Regional Tuberculosis Seminar and from 12th November, 1964 to 14th November, 1964 he was in Bangkok on a Post Seminar Tour.

At the end of the year the composition of the Staff was as follows:—

Assistant Director of Medical Services (Tuberculosis).	2 General Clerical Officers.
4 Medical Officers.	Clerical Officer (Interpreter).
Higher Executive Officer (Registrar, Tuberculosis Registry).	10 Clerical Assistants.
2 Radiographers.	Senior Assistant Nurse.
5 Laboratory Technicians.	22 Assistant Nurses.
2 Laboratory Technicians in Training.	Typist.
Sister.	6 Junior Photographic Assistants.
12 Staff Nurses.	6 Laboratory Attendants.
	10 Drivers, General Purpose.
	2 Office Boys.

### ADMINISTRATION

The Tuberculosis Control Unit serving as the centre of all activities against tuberculosis continued the following functions:—

- (a) The maintenance of a Central Tuberculosis Registry which is the centre for accurate, complete and current information on all notified tuberculosis cases.
- (b) The maintenance of a Central Tuberculosis Laboratory (previously known as Central Culture Laboratory) for the examination and culture of sputum and sensitivity tests of mycobacterium tuberculosis to anti-tuberculosis drugs.
- (c) The maintenance of a Diagnostic Clinic (previously known as Recall Clinic) for the follow-up of cases recalled from X-ray Surveys, the periodical check-up of cases initially diagnosed as "Scars" and the assessment of cases not yet proven as active.
- (d) The maintenance of a Contact Clinic for the follow-up and examination, including home visits and clinic attendances, of all contacts of known cases.
- (e) To direct and supervise the State B.C.G. campaign.
- (f) To provide the School Tuberculosis Service.
- (g) To conduct Mass and Group X-Ray Surveys.
- (h) To teach and train personnel in all aspects of Tuberculosis Control, such as home visitors, laboratory technicians and Staff Nurses on the Public Health Nursing Course.
- (i) To formulate plans for the effective control of tuberculosis.

## WORLD HEALTH DAY 1964

The theme for the celebration of World Health Day for 1964 was “No Truce for Tuberculosis”. As Tuberculosis is an important problem in Singapore it was thought appropriate to celebrate the World Health Day by holding an Anti-Tuberculosis Week from 6th April to 12th April. The high light of the Anti-Tuberculosis Week was an exhibition on the treatment and prevention of the disease, open houses at the Tuberculosis Institutions and extensive press and Radio and Television publicity. The Tuberculosis Control Unit, Tan Tock Seng Hospital and S.A.T.A. took part in the Week’s activities. The Anti-Tuberculosis Exhibition was held in the Victoria Memorial Hall from April 7th to 12th and was opened by the Minister for Health Mr. Yong Nyuk Lin. A Mobile X-Ray Unit was available at the exhibition to X-ray visitors coming to see the exhibits. A total of 1,940 X-rays was taken. All sections of the Tuberculosis Control Unit, Tan Tock Seng Hospital and SATA were represented in the Exhibition. The exhibition was a great success.

## CENTRAL TUBERCULOSIS REGISTRY

The number of tuberculosis notifications registered was 4,452. The following statement shows the number of notifications received for the year by month. For comparison figures for 1960, 1961, 1962 and 1963 are also given.

STATEMENT SHOWING NUMBER OF NOTIFICATIONS REGISTERED IN  
1960, 1961, 1962, 1963 AND 1964 BY MONTHS

		Number Registered				
Month		1960	1961	1962	1963	1964
January	...	287	295	528	331	367
February	...	298	267	476	179	256
March	...	507	600	438	336	316
April	...	370	568	382	346	357
May	...	454	614	495	194	228
June	...	464	497	551	273	542
July	...	604	510	500	436	416
August	...	554	425	400	522	379
September	...	449	511	605	420	290
October	...	323	660	503	606	461
November	...	353	628	372	483	416
December,	...	394	724	523	528	504
Total	...	<u>5,057</u>	<u>6,299</u>	<u>5,773</u>	<u>4,654</u>	<u>4,532*</u>
Monthly Avg.	...	421	525	481	388	377
* Provisional only.						



The position of the Central Tuberculosis Register as at 31st December, 1964 was as follows:—

#### CENTRAL TUBERCULOSIS REGISTER

Cases as at 1-1-64	...	...	...	...	25,666
Add cases registered in 1964					
(a) Pulmonary	...	...	4,430		
(b) Extra-Pulmonary	...	...	102		4,532
					<hr/> 30,198
Less Cases removed from Register in 1964	...	...	...		1,012
					<hr/> 29,186

Further statistics on tuberculosis appear in Tables 133–139.

#### CENTRAL TUBERCULOSIS LABORATORY

*(Previously known as Control Culture Laboratory.)*

The Central Tuberculosis Laboratory continued its function of performing bacteriological examinations in connection with tuberculosis and cultures and sensitivity tests for mycobacterium tuberculosis for all Government Hospitals and Outdoor Dispensaries. Positive cultures were also received from the Royal Singapore Chest Clinic for drug sensitivity tests. Specimens, though small in number were also received from the Youngberg Memorial Hospital, British Military Hospital, and from Sabah and Sarawak. The study on the virulence of tubercle bacilli in co-operation with the medical Research Council in London was continued.

The laboratory equipment donated by the UNICEF in 1963, have been installed and put into operation. The hot air oven is being utilised for drying the increased number of culture bottles and sterilizing all glass wares used in bacteriological work. Towards the end of the year the thermo-graph incubator apparatus was installed and the incubator room extended thereby increasing the incubating area for the cultures. The accurate registration of the required temperature shown on the weekly thermo-graph and the safety thermostatic control has eliminated the uncertainty of over-heating the cultures, thus enabling this laboratory to produce more accurate and a higher standard of work.

*Cultures.*—38,052 cultures were done in 1964 as compared with 30,300 in 1963. Out of the 34,492 cultures reported, 4,795 specimens were positive, showing a positive percentage of 13.9. As before, specimens of pus, tissues and currettings yielded the highest percentage of positives. Out of 232 specimens done, 39 cultures were positive (16.8%). Again, the cultures of larygeal swabs had the lowest contamination rate. Under the new system of collecting sputa under the direct supervision of a laboratory technician, the percentage of positives from Mass X-ray cases had been increased. The old system of supplying bottles to patients to collect sputa at home was discontinued.



*Sensitivity Tests.*—Drug sensitivity tests were carried out as in 1963 by the Resistance Ratio method of Dr. Michison on all positive cultures. The results had been very constant for the 3 main drugs.

*Research.*—Towards the end of the year laboratory in conjunction with Tan Tock Seng Hospital undertook a study on the comparative efficiency of Isoniazide in Combination with Thiacetazone against PAS plus Isoniazide. The laboratory is responsible for all the culture work including the sensitivity tests to the drugs used.

*Training.*—Lectures on the bacteriology of Tuberculosis were conducted in this Laboratory to the various batches of Public Health Nurses, and trainee nurses from General Hospital and Tan Tock Seng Hospital.

During the year, a number of doctors on W.H.O. Fellowship visited the laboratory. These doctors were highly impressed by the work and the whole set up of the laboratory.

Again the staff of the laboratory worked short-handed but despite this they had been able to cope most efficiently with the noticeably increase in the volume of work.

The work done during the year is tabulated below:—

#### CULTURES DONE DURING THE YEAR 1964

Number of Cultures done ...	...	...	38,052
Number of Cultures already reported ...	...	...	34,492
Number of Cultures still in incubation	...	...	3,560

Nature of Specimens	Total Re-ported	Number Nega-tive	Number Positive	Unclas. A.F.B.	Conta-minated	% Positive	% Conta-minated
Laryngeal Swabs ..	25,095	20,004	4,028	31	42	16.05	0.17
Sputum, Glavage and Mucous from Bron-chus .. ..	1,793	1,534	218	3	38	12.15	2.11
Urine .. ..	1,345	1,235	44	5	61	3.27	4.54
Cerebro-spinal Fluid ..	418	404	5	..	9	1.2	2.15
All Aspiration Fluids	501	461	34	..	6	6.7	1.20
Pus, Tissues, Bones, Currettings ..	232	185	39	..	8	16.81	3.45
Stool and Miscellaneous	35	28	2	..	5	5.71	14.29
Mass X-Ray L.S. ..	3,311	3,085	215	6	5	6.5	0.15
Mass X-Ray Sputum	1,762	1,550	210	1	1	11.9	0.05
Total ..	34,492	29,476	4,795	46	175	13.9	0.5

CONCENTRATED SMEARS DONE

Number of Smears done	Negatives	Positives	% Positive
1,990	1,852	138	6.9

DRUG SENSITIVITY TESTS DONE IN 1964

Number of Strains tested	...	...	...	5,342
Number of Strains reported	...	...	...	4,801
Number of Strains still in incubation		...	...	541
Number of Strains unsuccessful or contaminated			...	94

DRUG SENSITIVITY TESTS DONE BY RESISTANCE RATIO METHOD

Drugs		Strains	Sensitive	Doubtful	Resistant	Contaminated
INH	...	4,524	2,697	414	1,320	93
Streptomycin	...	4,524	2,767	205	1,459	93
P.A.S.	...	4,524	2,867	158	1,406	93
Cycloserine	...	277	232	39	5	1
Kanamycin	...	277	260	13	3	1
Viomycin	...	277	232	37	7	1
Ethionamide	...	277	227	37	12	1

MASS X-RAY CASE-FINDING SURVEYS

The Mass X-ray programme to X-ray the whole community who were above 14 years of age and resident in Singapore was continued. The area included in postal district one which was examined in the pilot survey in 1958 was re-surveyed. 8,114 residents were x-rayed and 656 of them were found to have suspicious lung Tuberculosis requiring investigation. In the latter part of the year the Mass X-ray Case-finding Unit was moved to Postal District 19. The fully mobile X-ray Unit donated by UNICEF was used completely in this survey. A total of 10,615 residents in the district was examined and 485 persons with suspicious lung tuberculosis were investigated.

In addition the Mass X-ray Units participated in the X-ray examinations of special groups in the Government Service and elsewhere. A total of



47,538 X-ray examinations was made in the year. A detail break down of the Mass X-ray Community and Group Survey appears in the table below:—

	No. X-Rayed	Suspicious lung T.B. requiring investigation	Scars as a result of healed tuberculosis	Bronchiectasis and Cysts	Other non-Tuberculous lung diseases	Heart abnormalities	Total of abnormalities	Technical Fault and Artefact
<i>Community X-Ray Survey</i>								
Anti-T.B. Week ..	1,940	90	39	4	26	4	163	5
Postal District 1 ..	8,114	656	296	22	90	25	1,089	11
Postal District 19 ..	10,615	485	117	32	140	43	817	14
Southern Islands ..	1,112	43	7	3	8	11	72	6
Total ..	21,781	1,274	459	61	264	83	2,141	36
<i>Group X-Ray Survey</i>								
Police Dept. ..	3,792	115	37	1	27	6	186	..
Telecommunication Dept. ..	20	1	..	..	..	..	1	..
Work Brigade ..	107	3	2	..	2	..	7	..
Public Health Div. Cleansing Section ..	1,853	142	32	1	26	9	210	4
School Teachers ..	13,490	334	318	3	114	23	792	15
School Staff and School Hawkers ..	5,219	224	118	4	47	18	411	5
Granite Quarries Workers ..	1,335	126	36	2	37	3	204	1
Govt. Medical Stores ..	105	2	1	..	2	..	5	..
Immigration Dept. ..	165	8	2	..	..	2	12	..
University of Singapore ..	798	15	9	1	7	2	34	3
Secondary School Leavers ..	14,123	159	200	5	141	15	520	10
General Electric Co. ..	109	7	1	1	1	..	10	..
Singapore Telephone Board ..	159	6	2	..	2	..	10	..
S.I.R. (Temasek Camp) ..	174	2	1	..	2	..	5	1
E.B.I. Ayer Rajah Road ..	17	1	..	..	..	..	1	..
School Children (Tuberculin Reactors) ..	4,865	118	341	1	42	9	511	..
R.S.P.C.A. Staff ..	4	..	..	..	..	..	..	..
Social Welfare Workers ..	7	..	..	..	..	..	..	..
Health Inspector (IOH) ..	6	..	..	..	..	..	..	..
National Service Recruits ..	990	46	16	1	7	9	79	1
Total ..	47,338	1,309	1,116	20	457	96	2,998	40
<i>X-Ray Service Only</i>								
T.T.S.H. Staff ..	2,550	..	..	..	..	..	..	..
Teachers New Recruits ..	722	..	..	..	..	..	..	..
Diagnostic Clinic ..	1,722	..	..	..	..	..	..	..
	4,994	..	..	..	..	..	..	..
Grand Total ..	74,113	2,583	1,575	81	721	179	5,139	76



*Static X-Ray Centre.*—The Static X-ray Centre established temporarily on the ground floor of the Tuberculosis Control Unit in November, 1963 was expanded so that two X-ray Units (one 70 mm unit and one 100 mm unit) were in operation simultaneously. Groups that could be brought to the Static X-ray Units were examined in the Static Centre.

*Diagnostic Clinic.*—Persons with abnormality found in the Chest X-rays after a Mass X-ray Survey were referred to the diagnostic Clinic for investigation. The previous “recall” rate after Mass X-ray examination of 10 per cent in 1948 had now dropped in recent years to 6.6 per cent (1964).

In the year 2,630 new patients were registered for investigation after Mass X-ray examination. The total attendance at this clinic was 8,819 visits.

#### TUBERCULIN TESTING AND B.C.G. VACCINATION

*Newborn Infants.*—The B.C.G. team at Kandang Kerbau Maternity Hospital continued its work of giving B.C.G. vaccination to newborn infants delivered in the hospital. Of 34,437 infants discharged as fit from the institution in 1964, B.C.G. vaccinations were given to 34,252 showing a response of 99.5 per cent.

B.C.G. vaccination of newborn infants, delivered in the rural areas started in 2 Maternal and Child Health Clinics in 1957 and subsequently extended to all rural maternal and Child Health Clinics, was continued. The mobile rural B.C.G. teams in this year were able to double their sessional time at the various clinics. A total of 7,128 Infants were given B.C.G. in these rural Clinics in 1964.

B.C.G. vaccination at the City Maternal and Child Health Clinics started in July 1958 was also continued. 7,745 infants were given B.C.G. vaccination in the year.

*Institutions.*—During the year, tuberculin testing and B.C.G. vaccination were carried out in 16 institutional homes, 7 creches and 2 nursing schools. 650 children newly admitted to the Homes and Creches were tested with tuberculin, 122 of them were vaccinated with B.C.G. 647 new nursing students were also tested and 89 of them were vaccinated with B.C.G.

#### CONTACT EXAMINATION

Contact investigations offer an important source in the finding of active cases. All immediate contacts of all the notified cases in the central register were examined. Contacts below the age of 15 years were first tuberculin tested. Negative reactors to Tuberculin were given B.C.G. vaccination. Positive reactors were given Chest X-ray examinations. Contacts above the age of 15 years were all X-rayed.

During the year the Contact investigation section was re-organised. Contacts are now examined with the family as a unit, thus making sure that no one in the family was missed. The clinic sessions were increased in September from 3 to 5 sessions per week to deal with the increased work.

New contacts examined in the contact clinic numbered 15,203. During the year 12,397 contacts under 15 years were Tuberculin Tested. 12,379 of them completed the test and 2,250 were read as Tuberculin negative 2,109 of the negative reactors were given B.C.G. vaccination.

10,830 contacts above the age of 15 were X-rayed and after investigation 244 were found to have active pulmonary Tuberculosis giving a rate of 2.2 per cent.

102 new cases for chemoprophylaxis were added to the 1,521 cases carried forward from the previous year.

*Home Visits.*—Home visits were made by nurses of this section to initiate the contact investigations of all notified cases and also to ensure that those under treatment in Tan Tock Seng Hospital were taking their treatment as advised. Defaulter checking forms an important part of the work of this section.

During the year home visits were made to 4,301 families of the new cases notified in 1964. 559 of them could not be traced. 8,944 revisits were also made to the homes of the new and old notified cases making a total of 13,250 visits in this year.

During the Mass X-Ray Surveys of Postal Districts one and nineteen a total of 12,884 visits was made to the residents of the area to encourage them to attend for the X-ray examinations.

#### SCHOOL TUBERCULOSIS SERVICE

This service consists of

- (1) Tuberculin Testing and B.C.G. Vaccination of School Children.
- (2) Casefinding in Schools.
- (3) Investigation and treatment of cases found in the schools.
- (4) Contact investigation of Index cases found in schools.
- (5) Supplementary feeding of infected and undernourished school children.

#### *Tuberculin Testing and B.C.G. Vaccination in Schools*

Tuberculin Testing and B.C.G. vaccination were done in 465 schools (37 Malay schools, 232 Chinese schools, 15 Indian schools and 181 English schools) in Singapore. All Primary I and Primary VI classes with parental consent, were given tuberculin tests. Negative reactors to these were given B.C.G. vaccination. Severe reactors to the test were X-rayed.

During the year 83,440 children were tuberculin tested. Of the 80,930 children available for reading of the test 33,186 children were negative and 32,925 given B.C.G. vaccination. 3,534 children were severe reactors to the Tuberculin tests and were x-rayed. 28 cases of active pulmonary tuberculosis and one case of Pleural effusion were discovered (0.8 per cent active).



## TUBERCULIN TESTING AND B.C.G. VACCINATION SCHOOL CHILDREN

## NUMBER OF SCHOOLS COVERED

Year		Malay	Chinese	Tamil	English	Total
1957	...	31	123	12	157	323
1958	...	20	28	—	140	188
1959	...	53	401	12	235	701
1960	...	62	397	16	267	742
1961	...	49	283	12	250	594*
1962	...	35	234	15	162	446
1963	...	35	229	15	173	452
1964	...	37	232	15	181	465

\* After 1960 Primary Schools having morning and afternoon sessions are counted as one instead of two schools.

TUBERCULIN TESTING AND B.C.G. VACCINATION  
IN SCHOOLS

Year		Tuberculin Test done	No. Read	No. Negative	No. given B.C.G.
1959	...	61,436	59,822	19,571	19,532
1960	...	70,172	67,538	23,710	23,144
1961	...	59,301	57,925	18,456	18,439
1962	...	75,763	73,538	25,247	25,247
1963	...	81,484	79,270	27,696	27,672
1964	...	84,524	82,003	33,370	33,104

*Case-finding in Schools*

Active case-finding to detect tuberculosis was continued. Cases with symptoms amongst the school population were as usual referred by the School Health Service to the School Tuberculosis Clinic at the Institute of Health.

For this year routine X-ray examinations were performed on

- (a) All Secondary School Leavers.
- (b) Primary I and Primary VI children who reacted severely to Tuberculin.
- (c) School Teachers.
- (d) Other school employees including canteen staff.

Of 14,123 Secondary School Leavers X-rayed, 530 had abnormalities in the chest X-ray film of which 159 were due to tuberculosis requiring investigation and 200 inactive tuberculous scars.

Out of 3,534 severe reactors to Tuberculin from Primary I and VI school children 28 cases of active Tuberculosis. One case of Pleural Effusion and 4 cases of Tuberculosis Spine were discovered. In addition 356 cases of inactive Tuberculosis and heal scars were investigated.

The two-yearly compulsory X-ray Examination of all school teachers and other staff was due in this year. Altogether 13,490 teachers were examined by mass X-ray, 334 of them were found to have suspicious lung tuberculosis and 318 scarring as the result of healed tuberculosis. From this survey 5 new active cases were discovered and given treatment.

Amongst the 5,219 school other staff and school hawkers X-rayed 224 were referred for investigation with suspicious lung tuberculous lesions, another 118 had healed scars requiring no treatment. After investigation 11 of the 224 for investigations were confirmed as active new tuberculosis cases.

#### *School Tuberculosis Clinic*

All active cases discovered by the X-ray Surveys amongst the school population were treated at the School Tuberculosis Clinic at the Institute of Health. In addition suspected chest cases found by the school Medical Officers were referred to this clinic for investigation and treatment.

The table below shows the routine clinic attendances at the School Tuberculosis Clinic in 1964.

		School Children	Teachers	Other Staff and Hawkers	Total
New cases	...	298	8	35	341
Re-Visits	...	4,921	168	369	5,458
Total	...	5,219	176	404	5,799

#### *Contact Investigation of Index cases found in Schools*

Any active Tuberculosis case from the schools irrespective of their place of treatment (viz. Tan Tock Seng Hospital, SATA and General Practitioners etc.) were notified to the school Tuberculosis Clinic. On receipt of the information the school contacts of the index case were examined. Those in the primary schools were tuberculin tested and positive reactors were sent for chest X-rays. In the secondary school all contacts in the class were X-rayed.

In 1964, 339 class contacts from the primary schools were enrolled. Out of these 259 were tuberculin tested 251 of those tested were available for reading of the test. 151 children were naturally positive and 63 positive due to previous B.C.G. vaccination. Of the 31 read negative to tuberculin, B.C.G. were given to all of them. X-ray examination of these 339 class contacts reveal 7 cases of scarring due to previous tuberculosis infection.

889 class contacts from the secondary schools were X-rayed and investigated. The result was 901 (97 per cent) normal X-rays 14 (1.5 per cent) Scars 5 (0.5 per cent) Active pulmonary Tuberculosis one (0.1 per cent) inactive pulmonary tuberculosis, 2 due to non-tuberculous condition and 6 still under investigation.



*Supplementary Feeding of Infected and Undernourished School Children*

This Feeding Scheme started in April 1949 was continued. For 1964 the sum of \$25,000 was allotted for this purpose. 351 new cases were put on feeding during the year. Altogether 7,198 "feeds" were given to 597 children. The feeding was a fortnightly distribution and each "feed" consisted of:—

1 lb. Full Cream Milk Powder.	6 Eggs.
$\frac{1}{2}$ lb. Skimmed Powdered Milk.	6 Oranges.
$\frac{1}{4}$ lb. Ovaltine.	1 lb. Groundnuts.
$\frac{1}{2}$ lb. Butter.	

In addition 10,800 lbs. of skimmed milk powder donated by UNICEF were distributed to other school children and contacts.

*Feeding 1964*

Cases on feeds carried forward from December, 1963	...	246
New cases	...	351
Total	...	597
Cases off feeds in 1964	...	309
Cases carried toward to 1965	...	288

TABLE 134

## TUBERCULOSIS NOTIFICATIONS FOR THE YEAR 1964

SHOWING FORM OF DISEASE, RACE AND SEX

Form of Disease		CHINESE			MALAYS			INDIANS AND PAKISTANIS			OTHERS			PERSONS		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
PULMONARY	Minimal ..	1,111	415	1,526	163	40	203	89	18	107	13	5	18	1,376	478	1,854
	Moderately Advanced	954	287	1,241	130	33	163	81	12	93	9	4	13	1,174	336	1,510
	Far Advanced	452	141	593	57	33	90	38	7	45	2	2	4	549	183	732
	Extent not stated ..	173	56	229	12	10	22	11	1	12	..	..	..	196	67	263
Primary ..		7	5	12	3	1	4	1	..	1	..	..	..	11	6	17
Miliary ..		13	2	15	1	4	5	..	1	1	..	..	..	14	7	21
Meningitis ..		6	6	12	2	3	5	..	..	..	..	..	..	8	9	17
Pleural Effusion ..		19	22	41	5	1	6	5	2	7	..	..	..	29	25	54
Other Forms ..		18	23	41	6	6	12	6	5	11	..	..	..	30	34	64
Total ..		2,753	957	3,710	379	131	510	231	46	277	24	11	35	3,387	1,145	4,532



TABLE 135  
TUBERCULOSIS NOTIFICATIONS FOR THE YEAR 1964  
SHOWING AGE, SEX AND FORM OF DISEASE

Age Group in years	MALES						FEMALES						PERSONS								
	Pulmonary	Primary	Miliary	Meningitis	Pleur. Effus.	Other Forms	Total	Pulmonary	Primary	Miliary	Meningitis	Pleur. Effus.	Other Forms	Total	Pulmonary	Primary	Miliary	Meningitis	Pleur. Effus.	Other Forms	Total
0—4	3	1	2	2	..	..	8	3	1	..	3	..	..	7	6	2	2	5	..	..	15
5—9	7	9	..	1	3	5	23	3	3	3	1	1	2	13	10	12	3	2	4	7	36
10—14	30	..	..	1	4	2	36	24	2	..	1	1	4	32	54	2	..	2	4	6	68
15—19	219	1	1	..	4	4	229	100	..	1	2	3	5	111	319	1	2	2	7	9	340
20—24	225	..	1	1	5	6	238	116	..	1	..	5	6	128	341	..	2	1	10	12	366
25—29	263	..	..	..	1	4	268	91	..	..	..	4	6	101	354	..	2	..	5	10	369
30—34	238	..	1	..	2	1	242	103	..	1	..	..	3	107	341	..	2	..	2	4	349
35—39	285	..	2	..	..	3	290	114	..	..	..	..	3	117	399	..	2	..	..	6	407
40—44	295	..	..	..	2	..	297	102	..	..	1	3	..	106	397	..	..	1	5	..	403
45—49	314	..	1	..	3	..	318	82	..	..	..	1	2	85	396	..	1	..	4	2	403
50—54	406	..	2	..	1	2	411	92	..	1	..	3	2	98	498	..	3	..	4	4	509
55—59	409	..	..	1	4	1	415	88	..	..	1	1	1	91	497	..	..	2	5	2	506
60—64	303	..	1	..	2	2	308	71	..	..	..	1	..	72	374	..	1	..	3	2	380
65—69	163	..	1	..	1	..	165	35	..	..	..	1	..	36	198	..	1	..	2	..	201
70—74	75	..	..	1	..	..	76	24	..	..	..	1	..	25	99	..	..	1	1	..	101
75 Over	57	..	2	1	..	..	60	16	..	..	..	..	..	16	73	..	2	1	..	..	76
Not Stated	3	..	..	..	..	..	3	..	..	..	..	..	..	..	3	..	..	..	..	..	3
Total ..	3,295	11	14	8	29	30	3,387	1,064	6	7	9	25	34	1,145	4,359	17	21	17	54	64	4,532

TABLE 136  
TUBERCULOSIS NOTIFICATIONS FOR THE YEAR 1964  
SHOWING AGE, RACE AND SEX

Age Group in years	CHINESE			MALAYS			INDIANS AND PAKISTANIS			OTHERS			PERSONS		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
0—4	5	2	7	..	3	3	2	1	3	1	1	2	8	7	15
5—9	17	9	26	5	4	9	1	..	1	..	..	..	23	13	36
10—14	27	27	54	6	2	8	3	..	3	..	..	..	36	32	68
15—19	200	97	297	24	8	32	3	1	4	1	2	3	229	111	340
20—24	195	104	299	29	15	44	12	7	19	2	2	4	238	128	366
25—29	221	81	302	38	13	51	8	6	14	1	1	2	268	101	369
30—34	190	86	276	24	17	41	24	4	28	..	..	4	242	107	349
35—39	210	94	304	44	15	59	32	7	39	1	1	5	290	117	407
40—44	203	90	293	49	11	60	42	4	46	1	1	4	297	106	403
45—49	244	68	312	38	13	51	34	3	37	1	1	3	318	85	403
50—54	345	87	432	38	9	47	24	2	26	..	..	4	411	98	509
55—59	352	80	432	39	8	47	24	2	26	1	1	1	415	91	506
60—64	269	62	331	24	9	33	15	1	16	..	..	..	308	72	380
65—69	147	33	180	15	2	17	2	..	2	1	1	2	165	36	201
70—74	70	24	94	3	..	3	3	..	3	1	1	1	76	25	101
75—Over	55	13	68	3	2	5	2	1	3	..	..	..	60	16	76
Not Stated	3	..	3	..	..	..	..	..	..	..	..	..	3	..	3
Total	2,753	957	3,710	379	131	510	231	46	277	24	11	35	3,387	1,145	4,532



TABLE 137  
TUBERCULOSIS NOTIFICATIONS FOR THE YEAR 1964  
SHOWING OCCUPATION, RACE AND SEX

Occupation	Code	CHINESE			MALAYS			INDIANS AND PAKISTANIS			OTHERS			GRAND TOTAL		
		M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total
Professional, Technical and Related Occupation ..	0/09	48	18	66	5	1	6	2	..	2	..	1	1	55	20	75
Administrative, Executive and Managerial Occupations (Excluding Those in Agriculture and Retail Trade) ..	10/19	11	..	11	2	..	2	..	..	..	2	..	2	15	..	15
Clerical Occupations ..	20/27	146	21	167	21	..	21	12	..	12	4	3	7	183	24	207
Sales and Related Occupations ..	30/39	391	21	412	7	..	7	27	1	28	..	..	..	425	22	447
Agricultural Occupations ..	40/49	62	3	65	27	..	27	..	..	..	..	..	..	89	3	92
Mines, Quarrying and Related Occupations ..	50/54	2	..	2	..	..	..	..	..	..	..	..	..	2	..	2
Transport and Communication Occupations ..	60/69	194	..	194	69	..	69	13	..	13	3	1	4	279	1	280
Craftsmen, Production Process Workers and Labourers N.E.C.	70 & 80	555	35	590	73	1	74	78	..	78	3	..	3	709	36	745
Service, Sport, Entertainment and Recreation Occupations ..	90/99	98	47	145	43	4	47	23	2	25	2	..	2	166	53	219

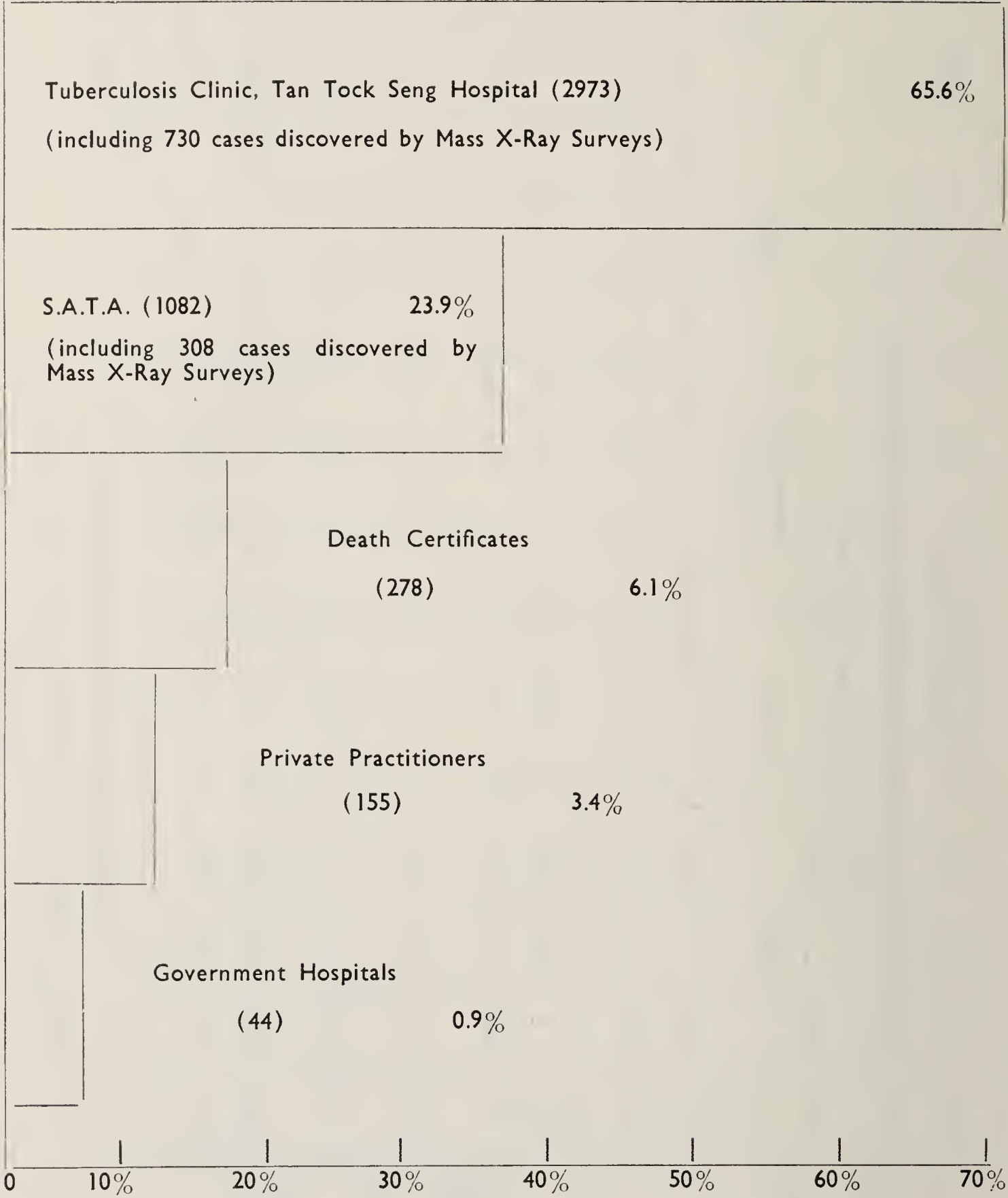
TABLE 137—*contd.*  
TUBERCULOSIS NOTIFICATIONS FOR THE YEAR 1964  
SHOWING OCCUPATION, RACE AND SEX

Occupation	Code	CHINESE			MALAYS			INDIANS AND PAKISTANIS			OTHERS			GRAND TOTAL		
		M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total
PERSONS ECONOMICALLY ACTIVE																
Home Housework ..	55	2	625	627	1	104	105	..	35	35	..	4	4	3	768	771
Full Time Student ..	56	144	74	218	20	6	26	6	4	10	1	..	1	171	84	255
Inmates of Mental Hospitals and Penal Institutions ..	57	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pensioners and Persons with Private Means ..	58	10	..	10	5	..	5	1	..	1	..	..	..	16	..	16
All Other Economically Inactive (e.g. 'Disabled', 'Too Old', 'Too Young', 'Inactive', etc.)	59	886	112	998	76	15	91	49	3	52	8	2	10	1,019	132	1,151
Occupation Not Stated ..	11.11	204	1	205	30	..	30	20	1	21	1	..	1	255	2	257
Total ..		2,753	957	3,710	379	131	510	231	46	277	24	11	35	3,387	1,145	4,532



Table 138

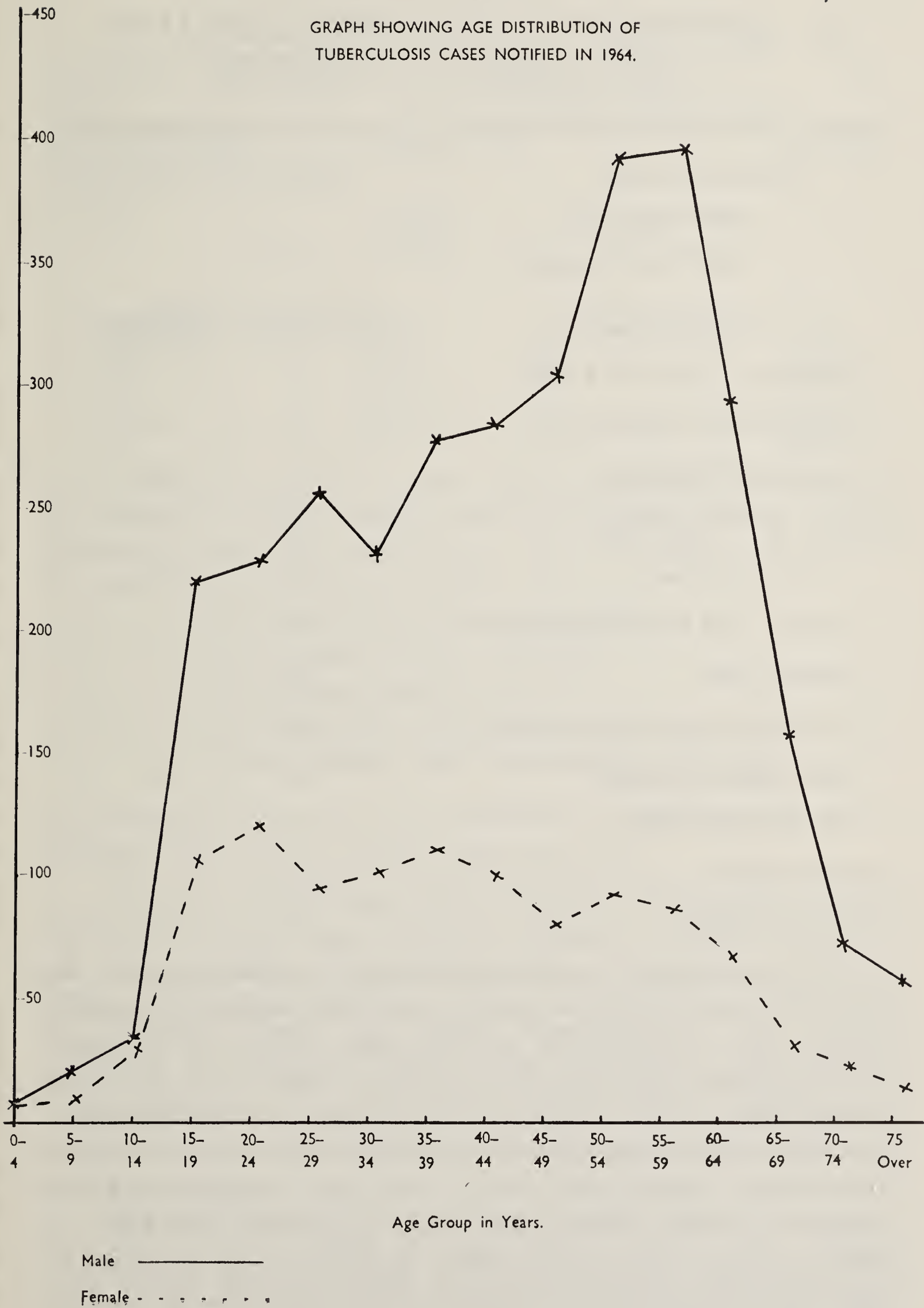
Histogram showing the source of discovery of cases of tuberculosis percentage of total notifications for the year 1964.



As at 31-12-64, a total of 4,532 notifications was received.

Table 139

GRAPH SHOWING AGE DISTRIBUTION OF  
TUBERCULOSIS CASES NOTIFIED IN 1964.





## 29. GOVERNMENT PHARMACEUTICAL LABORATORY AND STORE AND DISPENSARIES

THE staff position at the end of the year is given in the table hereunder.

### *Professional Staff:*

Chief Pharmacist	...	1	
Dy. Chief Pharmacist	...	1	
Department.		Pharmacist	Sr. Disp. and Disp. Assts.
Government Pharm. Lab. & Store	...	4	8
General Hospital Dispensary	...	6	41
Out-Patient Dispensaries	...	10	30
K. K. M. H. Dispensary	...	2	7
T. T. S. H. Dispensary	...	2	8
Thomson Road Hospital Dispensary	...	1	4
Trafalgar Home	...	1	1
Woodbridge Hospital Dispensary	...	1	1
Social Hygiene Dispensary	...	1	4
Min. of Health (Hqrs.)	...	1	—
School Health	...	—	3
Chronic Hospital	...	—	1

All vacancies, except one pharmacist's post, were filled, but due to the call-up of Storemen/packers for National Service, the Government Pharmaceutical Laboratory and Store has had to manage without four Storemen/packers. However, production and execution of orders for supplies were maintained without a hitch. During the course of the year indenting procedures were reviewed and stricter controls were introduced in order to eliminate over stocking by indenting units. Orders for new items of drugs etc. had to be approved by a Drugs Advisory Committee or by the head of the Dept. All surplus, or unused drugs in Out-Patient Dispensaries were transferred to units that could use them. The following table gives an idea of the work undertaken by Government Pharmaceutical Laboratory and Store in 1964,

COMPARATIVE TABLE WORK AT GOVERNMENT  
PHARMACEUTICAL LABORATORY AND STORE

Stores Section		Laboratory Section	
Number of order for supplies to hospitals, clinics, etc. in 1964	10,605	Number of Works Tickets completed by Laboratory ...	2,614
Total value of drugs, chemicals, etc. distributed	2,400,926	Nett value of materials used in manufacture of pharmaceuticals	1,003,667
Total value of surgical equipment, dressings and sundries distributed	764,263		
Total	3,165,189		

Turnover for past 4 years (Total value of stores supplied)			Production for past 4 years Nett value of materials used)		
1961	...	2,620,447	1961	...	886,877
1962	...	3,042,902	1962	.....	1,025,864
1963	...	3,227,277	1963	...	1,034,127
1964	...	3,165,189	1964	...	1,003,667

Of the total value of \$2.4 million worth of drugs issued out, the units of the Ministry of Health expended about \$1.75 million. Of this \$326,902 accounted for antibiotics (roughly 20 per cent). Other main items accounting for roughly 50 per cent of the expenditure are: —

- (1) Anti-tuberculosis drugs, 15 per cent.
- (2) Anti-diabetic drugs, 10 per cent.
- (3) Psychiatric drugs, 10 per cent.
- (4) Anti-infectives, 10 per cent.
- (5) Anti-histamines and Corticosteroids, 5 per cent.

The remaining 30 per cent of the expenditure is accounted for by over a thousand items of drugs including vaccines and sera.

The value of manufacture of pharmaceuticals during the year amounted to a little over a million dollars. The installation of a new boiler, costing \$31,000 with adequate steam capacity has enabled the laboratories to produce an adequate quantity of transfusion solutions to meet any emergency. Other manufacturing equipment to speed up processing of materials were also installed. However, the physical accommodation in the Galenical Laboratory and Injection Laboratory has been utilised to the limit and further expansion of these laboratories is urgently required. During the two Civil disturbances, the manufacture and delivery of essential drugs, and transfusion solutions were maintained and no shortages of essential supplies were experienced.

The Stores Section, which has had a very good record in respect of losses and write-offs over a number of years, reported losses of drugs valued at \$556 on three separate occasions. These were thoroughly investigated by me and the police who came to the conclusion that the thefts were inside affairs. The employment of a large number of division IV officers who are known



to be in financial difficulties poses a constant security problem. One of the suspected officers has been transferred and another officer's confirmation on pensionable establishment has been deferred. Decision on one other officer, who has a police record is pending. The security arrangements at the Stores were reviewed with the assistance of the Commissioner of Police and work is in progress to improve security by raising the height of the perimeter fence and to fence off the drivers' quarters in the premises, so that the residents and visitors will not have access to the stores premises.

The closure of the O.P. Department at General Hospital on August 1st and the introduction of charges for outpatients has contributed significantly to lowering of the consumption of drugs. The Unallocated stores provision of \$85,000 intended to cover the estimated increase in consumption was not utilised and has been offered as savings to meet the deficit in the personal emoluments vote of Headquarters. In spite of additional expenditure on expensive anti-tuberculosis drugs to treat cases resistant to P.A.S. — I.N.H. and Streptomycin which are the standard drugs, available at low cost, the reduction in expenditure is heartening. The total drug cost of \$1.75 million represents an expenditure of \$1 per head of population per year. The comparative figure for U.K. is 8/6 (\$3.64) per prescription and total drug bill amounts to about £60 millions.

The Poisons Schedules were amended by addition of new substances and relaxation of control over animal feeds containing antibiotics. Chlorates, which could be used as explosives, were controlled by inclusion in the Poisons Schedule. The Inspector of Poisons, in conjunction with the Police prosecuted offenders under the Poisons Ordinance and Med. (Advt. & Sale) Ordinance and several convictions were recorded. The licences of two pharmacists were withdrawn during the year for offences under the Poisons Ordinance.

## 30. LABORATORY SERVICES

### PATHOLOGY DEPARTMENT

THE volume and scope of work shows the yearly upward trend in all sections. Besides ordinary routine more new specialised tests have been introduced. We have been able to do this in spite of staff shortage and rising costs of chemicals, sera and glass ware. OCAR vote has been insufficient and we were forced to draw upon savings from other votes. The report of the Department is outlined as below :

#### *Development Projects*

(a) *Extension to Biochemical Laboratories.*—Three rooms on the top floor have been converted into laboratories. Water, gas, electrical installations and work benches have been installed. A fume cupboard has been added. This will reduce occupational hazard to workers from noxious and poisonous fumes. The cost of this project is \$15,000. Phase II costing \$20,000 will start this year for additional development.

(b) *Conversion of Animal Rooms into Virology laboratories.*—This project costing \$11,630 was completed in December 1964. Two rooms which housed animals have been converted into laboratories. Water, gas, electrical fittings and work benches have been installed. Necessary equipment to start virology arrived in 1963. The animals were transferred to the covered passage way connecting the old and new building. We would require about \$2,000 for additional furniture.

#### *Bacteriological Section*

(a) There were three small outbreaks of El Tor cholera. A total of 2,646 stools specimens from suspects, contacts were sent to the Department for investigation. Out of this, 24 cases were proven bacteriologically to be El Tor. Twenty-six specimens of water from ponds and 6 from cockles were examined as well. No El Tor organism was isolated from these specimens.

(b) *The City Laboratory.*—The staff shortage especially of Laboratory Technicians was acute: 2 vacancies since 1962 were only filled in 1964. The vacancies could not be filled until the findings of the Board of Inquiry into Rates of Pay and Conditions of Service of City Council Employees transferred to the Government were published. The staff worked under pressure and it is to their credit and devotion to duty that they worked without protest.

(c) *Lighting facilities.*—This has been improved by the installation of tubular fluorescent lights. The illumination obtained from the previous existing lights was unsuitable as technicians found difficulty in picking up tiny colonies from plates.



*Morbid Histology*

(a) This section was depleted by the departure of the Supernumerary Pathologist in June, along with his wife. The remaining Pathologist was fully occupied with technical work as well as undertaking the training of Medical Officers (trainees), Department of Pathology. Efforts to recruit a Senior Registrar from U.K. elicited no response. Negotiations are still going on with the Australian Government for a Colombo Plan expert in Pathology. It is hoped that this will be successful otherwise there is every possibility of a break down in this service. It has been the policy to encourage local graduates to take up Pathology as a career but over the years medical officers in the Ministry of Health have shown a decided reluctance to do so. However, in 1964 the position has improved and two medical officers have decided to remain in the Department. The action of the Ministry in securing two scholarships for training in the D.C.P. Course has been a major factor in this issue. Both these officers are undergoing training and it is expected to send one overseas in August this year. It was suggested to the Ministry that medical officers posted to Surgical and Gynæcological units be posted to the Department for 1-2 months for training. This was accepted in principle but somehow never implemented.

(b) The working conditions of staff in the main Histology room have been uncomfortable. The two air conditioners have never been working satisfactorily in spite of repairs. They had been switched off for some months. Due to vigorous agitation by the Department the D.P.S.C. finally agreed to our proposal to replace these two units by new ones. As from January this year the new units have been installed to the satisfaction of the staff concerned.

(c) *Senior Lecturer in Medical Jurisprudence.*—Dr. E. B. La'Brooy of the Faculty of Medicine was appointed in September 1964 to the above post working under the Senior Pathologist. He is available for consultation by trainee medical officers of the Department as well as doing a small number of the important medico-legal post mortems.

(d) *Racial Riots. Work in G.H. Mortuary.*—It is with satisfaction that we record that the staff of doctors, laboratory technicians, mortuary attendants carried out their duties in an admirable manner and with close co-operation with Police.

*Biochemistry Section*

(a) Expansion of this section has been referred to previously under Development Projects under (1).

(b) *Schedule of Medical Laboratory Service Fees.*—As from 1st October, 1964 a scale of charges has been laid for Biochemical investigations. This was the only section where no fees were charged. As a result of this action a sum of \$13,000 approximately has been collected as revenue for October to December. This works out to about \$52,000 per year in revenue.

(c) The output in the varied work of the section was made possible only by the development of new, cheaper and faster methods adapted to routine jobs. There is a continual need for this development work in Clinical Biochemistry. It arises from the rapid progress of this subject in the field of medicine. Many of the tests which have been used in the past have now become obsolete and introduction of new tests requires numerous initial investigatory experiments before they can be put on a routine basis. The danger that faces the section now is the ever increasing demand for the established routine work with stationary staff numbers. This can only reduce the available resources devoted to these essential investigational developments in techniques. This retrograde reduction should be avoided at all costs.

### *The Training of Laboratory Technicians*

The new Scheme of Service for Laboratory Technicians came into force on 1st February, 1959. There has been a shortage of professional staff from 1959–1962 to give the full measure of training. This was to a certain extent improved by the recruitment of 2 expatriates from Israel in 1962. There are still a number of administrative problems involved in regard to the training. The reorganisation of the laboratories is a must and is long overdue if we are to have an efficient and co-ordinated service. There is a long felt need to set up a School for Laboratory Technicians just like the Nurses and Radiographers. One solution would be for the Ministry to obtain the assistance of the Singapore Polytechnic in starting a school for Technicians. This suggestion must be seriously considered for the present training programme needs revision and be placed on a systematic basis. The training of laboratory technicians lags far behind. The expansion of the Health Services due to its peculiar arrangement whereby a technician has to complete his three-year training before the Department which has recruited him can utilize his services. The revised programme suggested by the Department should be implemented as soon as possible.

In conclusion one looks back with satisfaction that a number of difficult problems have been solved satisfactorily. There are still a number to be settled but with perseverance, co-operation and good will of the staff there is no reason that further progress will be maintained in 1965.

### BIOCHEMISTRY SECTION

For the fifth year in succession there has been a large increase in the number of samples analysed and examinations carried out. The increase is shown in the table below:

Year		No. of analyses performed	% increase over previous years	Increase in No. of analyses over previous years
1960	...	15,221		
1961	...	20,391	34%	5,170
1962	...	26,458	30%	6,067
1963	...	38,053	44%	11,595
1964	...	52,408	38%	14,355



This growth of more than 350 per cent in the number of samples between 1960 and 1964 has been achieved with a nominal staff increase of less than 30 per cent. The results achieved reflect very creditably on the staff at all levels and I wish to express my appreciation to all my staff for the co-operation they had given me throughout the year.

The section is also responsible for the training of laboratory technicians in clinical biochemistry for all the other health and hospital establishments in Singapore. The system of training is essentially that of apprenticeship learned at the bench. This enables the technician during training to make some contribution to the work of the laboratory. There were four such trainees at the beginning of the year and this number increased to 9 towards the end of the year. Besides these there were two other university staff here for training. One of these returned to his Department at the end of the year.

Full details of the staff are given in Table 140.

It would not have been possible for the Section's own staff of 3 professional officers (one of whom started work only in September) and 7 technicians to cope with the work of the Section without the assistance of the trainees which numbered approximately 11. The staffing position was very critical during the greater part of the year and was easier by the end of 1964 as the third biochemist post was filled and nine technicians-in-training were posted to the Section instead of the usual four.

It can be seen that the Section is very dependent on the contribution of the trainees towards the Section's routine. This has many undesirable features, the first being the fluctuating number of trainees which the Section has no control over. This makes the planning of work most difficult. The other objection is that the service is relying upon students whose knowledge, skill and experience are not very high and this seriously limit the efficient working of the Section. The ideal should be to have fully trained staff to conduct all investigations.

During the last quarter of the year, major reconstruction work was undertaken to convert 5 vacant rooms into laboratories. Three of these are already in use and the others will be completed by this year. After the completion of the project there will be six proper biochemical laboratories instead of the two makeshift ones which housed the Section for the past five years. A new fume cupboard was also built in these laboratories.

In the past the number of tests available were rather limited. This was because of the lack of professional staff. Although the first Biochemist was appointed in 1953, it was not until 1962, (10 years later) that the second biochemist's post was filled. It is now realised that although the present section is the biggest Clinical Biochemistry Laboratories in Malaysia, the Section is still at the development stage and much has still got to be done in order to keep pace with the progress and expansion already made by the other branches of the medical service. Biochemical examination plays a very important part in modern medicine and the three biochemists can never hope to cope with the demands for biochemical investigations from more than 300



doctors in the Government service itself, let alone the University clinical departments which also make use of our services for research and teaching purposes. However a start has been made. Many new tests have been introduced since 1961 and many new methods which are cheaper, faster, more reliable and more adaptable to routine work had also been developed by the Section. The new methods that were developed recently by the Section are for determination of the following:

- (1) Lactic dehydrogenase in blood and body fluid
- (2) Glutathione in blood
- (3) Glutamate dehydrogenase in serum
- (4) Isocitric acid dehydrogenase
- (5) Fibrinogen in plasma
- (6) Cystine in urine (combine and free)
- (7) Ultra micro method for serum protein
- (8) Palladium combining capacity of serum used for diagnosis of cirrhosis liver or nephrosis
- (9) Glucose-6-phosphate dehydrogenase in cells
- (10) 6-phosphogluconolactone dehydrogenase in erythrocytes
- (11) Methamoglobin reductase
- (12) Sorbital dehydrogenase
- (13) Ascorbic acid in urine.

Besides the development of methods the Section is also conducting research in collaboration with other departments on projects of mutual interests. Among these may be cited the following:—

- (1) Biochemical causes of neonatal jaundice
- (2) Biochemical investigations of various types of liver diseases
- (3) Tetanus
- (4) Effects of repeated donations on serum iron levels of blood donors.

Enzymes play a very important role in metabolism and in diseases. Many of these enzymes can be determined and their activities in serum, erythrocytes or body fluids have been found to be useful for the confirmation of diagnosis of many disease states.

The usefulness of these tests is reflected by the number of such examinations as shown in Table 141. In 1961 the Section was only doing 5 types of enzymes. In 1964 the list of enzymes that can be assayed has increased to 24 and the examinations done numbered 7,779 as against 862 in 1961.

There is a laboratory specially set aside for enzymology. The tests are usually costly but the development of our own methods had made it possible for several of them to be put on a routine basis. What is required now is the technician staff to run them. This will relieve the biochemists of a very burdensome as well as time consuming job of doing the routine and enable them to concentrate more on their proper work of carrying out investigating and development work, library searching and trying out new methods which can be adapted to the work undertaken by the Section.

There is plenty of scope for expansion. As it is there is an urgent need to start a laboratory for micro and ultramicro analysis for the benefit of our very small patients.

When staff permits it is hoped that this laboratory will be started in 1965. There is also a need for a hormone laboratory for the study of endocrine disorders. At present the biochemical investigations are limited to the estimation of 17-ketosteroids and 17-hydroxycorticosteroids and 4 hydroxy-3 methoxymandelic acid. So much is now known about endocrine disorders and hormone metabolism that the setting up of a special laboratory for hormone estimations such as aldosterone, oestrogens, pregnandiol, and pregnantriols and catecholamines are now long overdue.

In March 1964 the Section started for the first time to open its laboratories to do urgent biochemical examinations for the hospitals during Sundays and public holidays. The urgent specimens for blood urea, sugar, amylase, bilirubin etc. has been done in the Central Laboratory of General Hospital for a long time. Because of the acute shortage of staff the laboratories of the Section are opened to do only urgent determinations on serum electrolytes. It is hoped that the range can be expanded as the staffing position improves.

As from October 1st 1964 the Section started charging fees for biochemical investigations from paying patients, private cases as well as those from Sarawak and Sabah. The fees collected for biochemical examinations alone (including those done in the Central Laboratory) amounted to \$13,445 for the last three months of the year. It is estimated that biochemical investigations will bring in approximately an additional \$50,000 to \$60,000 to revenue every year. As has been stated in the past it is hoped that this new income for the first few years should be channelled back to the Section for its much needed development.

Table 140

## STAFF LIST

Senior Biochemist: Lee Kum Tatt, B.Sc., Ph.D., M.C.I.C., F.R.I.C.

Biochemists: Tan It Koon, B.Sc., Irene Giam, B.Sc., M.S.

Laboratory Technicians: Ow Ah Kit, Goh Tuan Cheng, N. Thurairaja, Leong Chan Kay, Sharon Chow (Miss), J. D. Singh, Wee Toon Loon, Goh Boon Kang\*, Tan Kee Teng\*.

Technicians-in-training trained in the Section during the year: Koh Beng San, Cheng Yew Kee, Ray Tan Wee Lee, Chung Weng Kum, Choo Kim Leng, Ng Bee Tong, Sim Peck Seng, Lee Cheow Liang, Low Fatt Hing, Sim Hee Hua, Seet Poh Kwee, Dorothy Seet (Miss), Kwong Yoke Kuen (Miss), Teng Ah Too, Leo Jiah Sim.

\*University staff who worked in the Section during the year.



Table 141

				1961	1964
	Blood				
1.	Potassium	...	...	5,108	10,786
2.	Sodium	...	...	5,088	10,656
3.	Chlorides	...	...	5,069	10,637
4.	Calcium	...	...	527	707
5.	Inorganic P.	...	...	394	550
6.	Bilirubin, total	...	...	82	102
7.	Electrophoresis of Proteins	...	...	596	1,793
8.	Glucose Tolerance Test	...	...	4	20
9.	Alkali reserve	...	...	83	30
10.	Abnormal pigments	...	...	127	93
11.	Methæmoglobin	...	...	255	784
12.	Pyruvic acid	...	...	235	297
13.	Cholesterol	...	...	346	844
14.	Urea	...	...	16	45
15.	Uric acid	...	...	1	9
16.	Creatinine	...	...	123	358
17.	Creatine	...	...	4	11
18.	Serum Lipids	...	...	54	1
19.	Iron	...	...	26	2,059
20.	Copper	...	...	3	3
21.	Fibrinogen	...	...	—	314
22.	N.P.N.	...	...	—	21
23.	Amino acid Nitrogen	...	...	—	2
24.	Magnesium	...	...	—	16
25.	Congo Red	...	...	—	9
26.	B-carotene	...	...	—	7
27.	U.I.B.C.	...	...	—	684
28.	Salicylate	...	...	—	12
29.	Palladium combining power, neutral	...	...	—	378
30.	Palladium combining power, acid	...	...	—	131
31.	Glutathione	...	...	—	343
32.	Protein Bound Iodine	...	...	—	81
33.	pH	...	...	—	1
34.	Packed Cell Volume	...	...	—	464
35.	Pormimino-glutanic acid	...	...	—	2
	Urine				
36.	Calcium	...	...	58	94
37.	Inorganic P	...	...	99	94
38.	17 ketosteroids	...	...	147	411
39.	17 hydroxycorticosteroids	...	...	20	399
40.	Urea	...	...	14	2
41.	Amino acid N	...	...	15	27
42.	Creatinine	...	...	217	357
43.	Potassium	...	...	174	129
44.	Sodium	...	...	172	121
45.	Chlorides	...	...	173	109
46.	Nature of sugar, identification	...	...	2	4
47.	Total Protein	...	...	3	7
48.	Bence-Jones Protein	...	...	6	5
49.	Electrophoresis of Protein	...	...	3	5
50.	Mæmoglobin	...	...	64	61
51.	Methæmoglobin	...	...	64	57
52.	Coproporphyrin, quantitative	...	...	7	4
53.	Ascorbic acid	...	...	6	10
54.	5-hydroxy-indole-acetic acid	...	...	54	16
55.	Catecholamines	...	...	10	2
56.	Glucose	...	...	—	18
57.	Bile salts	...	...	—	1
58.	Copper	...	...	—	3
59.	Salicylate	...	...	—	1
60.	Phenol red	...	...	—	64
61.	Sulphonarides	...	...	—	1
62.	Chondroitin Sulphate	...	...	—	4
63.	4-hydroxy-3-methony-mandelic acid	...	...	—	137
64.	Sulkavitchs Test	...	...	—	10



Table 141 — *continued*

				1961	1964
	Fæces				
65.	Fat	...	...	41	101
66.	Trypsin	...	...	4	1
67.	Urobilinogen, quantitative	...	...	—	5
	Gastric Contents				
68.	Free acids	...	...	1	12
69.	Total acids	...	...	1	12
70.	Sodium	...	...	1	14
71.	Potassium	...	...	—	6
72.	Chlorides	...	...	—	10
73.	pH	...	...	—	12
74.	Specific gravity	...	...	—	2
	Sweat				
75.	Sodium	...	...	9	3
76.	Chlorides	...	...	3	3
77.	Calculi, chemical analysis	...	...	5	34
78.	Heart tissue for potassium	...	...	—	1
	C.S.F. and other Fluids				
79.	Potassium	...	...	1	1
80.	Sodium	...	...	1	1
81.	Chlorides	...	...	1	1
82.	Total protein	...	...	1	4
83.	Bile salts	...	...	1	1
84.	Glucose	...	...	—	1
85.	Bile pigments	...	...	—	1
	Enzymes				
	Blood				
86.	Alkaline phosphatase	...	...	106	222
87.	Acid phosphatase	...	...	23	5
88.	SGOT	...	...	552	3,719
89.	SGPT	...	...	186	1,679
90.	Aldolase	...	...	—	22
91.	Lactic Dehydrogenase	...	...	—	428
92.	I.C.D.	...	...	—	415
93.	Glutamate Dehydrogenase	...	...	—	167
94.	Sorbitol	...	...	—	183
95.	Phospho-hexose isomerase	...	...	—	7
96.	x-hydroxy butysic acid dehydrogenase	...	...	—	138
97.	Leucine-amino-peptidase	...	...	—	27
98.	G-6-P Dehydrogenase	...	...	—	41
99.	G-P-G. dehydrogenase	...	...	—	40
100.	Cholinesterase	...	...	—	12
101.	S.C.P.K.	...	...	—	5
102.	Gæruloplasmin	...	...	5	24
103.	Glutathione stability test	...	...	—	396
104.	Meth HG reduction test	...	...	—	167
	(C.S.F. and Gastric contents and other fluids)				
105.	Trysin	...	...	—	2
106.	Amylase, quantitative	...	...	—	2
107.	SGOT	...	...	—	31
108.	SGPT	...	...	—	35
109.	Pepsin	...	...	—	12
Grand Total				20,391	52,408

## HISTOLOGY SECTION

<i>Total number of sections:</i>	...	...	...	...	30,672
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*Sections from Biopsies:*

Total number of cases	...	...	...	12,644
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*Total number of Tissues	...	...	...	15,427
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*Total number of Sections	...	...	...	20,123
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(\* Including Cytological Exam.).

*Sections from Necropsies:*

Total number of cases	...	...	...	1,292
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Total number of sections	...	...	...	10,449
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Table 142

## ANALYSIS OF TISSUES EXAMINED — 1964

1. Anal and ischio-rectal tissues	...	...	...	233
2. Animal tissues	...	...	...	7
3. Appendix	...	...	...	1,062
4. Adrenals	...	...	...	5
5. Ascitic Fluid	...	...	...	79
6. Ampulla of Vater	...	...	...	1
7. Bladder	...	...	...	89
8. Bladder washout	...	...	...	4
9. Blood vessels	...	...	...	33
10. Bones	...	...	...	165
11. Bone marrow	...	...	...	15
12. Brain and meninges	...	...	...	25
13. Fluid from Brain	...	...	...	4
14. Broad Ligament and Parametrial tissues	...	...	...	6
15. Breast	...	...	...	241
16. Aspiration Breast	...	...	...	1
17. Bronchus	...	...	...	78
18. Bronchial smears	...	...	...	143
19. Blood Films	...	...	...	3
20. Cervix and cervical smear	...	...	...	1,333
21. Colon and rectum	...	...	...	106
22. Conjunctiva and cornea	...	...	...	16
23. Cerebro-spinal Fluid	...	...	...	28
24. Ear	...	...	...	59
25. Endometrium	...	...	...	4,786
26. Eye and Eyelids, etc.	...	...	...	87
27. Fallopian Tube	...	...	...	398
28. Faeces	...	...	...	2
29. Gall Bladder	...	...	...	152
30. Heart muscle	...	...	...	27
31. Hydrocele Fluid	...	...	...	4
32. Intestines	...	...	...	102
33. Joints and synovial tissues	...	...	...	117
34. Aspiration joints	...	...	...	4
35. Kidney	...	...	...	163
36. Larynx	...	...	...	100
37. Liver	...	...	...	492
38. Aspiration Liver	...	...	...	5
39. Lung	...	...	...	116
40. Aspiration lung	...	...	...	3

Table 142 — *continued*ANALYSIS OF TISSUES EXAMINED — 1964 — *continued*

41.	Lymph node	...	...	...	...	616
42.	Mastoid autrum	...	...	...	...	3
43.	Mesentery	...	...	...	...	15
44.	Muscles	...	...	...	...	66
45.	Mouth and Dental Diseases	...	...	...	...	61
46.	Mediastinum	...	...	...	...	1
47.	Nerves and sympathetic ganglia	...	...	...	...	144
48.	Nose and Nasopharynx and sinuses	...	...	...	...	396
49.	Oesophagus	...	...	...	...	167
50.	Omentum	...	...	...	...	48
51.	Ovary	...	...	...	...	448
52.	Fluid from ovary	...	...	...	...	1
53.	Palate	...	...	...	...	25
54.	Pancreas	...	...	...	...	16
55.	Parathyroid	...	...	...	...	2
56.	Penis	...	...	...	...	39
57.	Peritoneum	...	...	...	...	47
58.	Peritoneal Fluid	...	...	...	...	14
59.	Pharynx	...	...	...	...	8
60.	Placenta	...	...	...	...	36
61.	Pleura	...	...	...	...	135
62.	Pleural Fluid	...	...	...	...	246
63.	Prostate	...	...	...	...	124
64.	Pus	...	...	...	...	1
65.	Pericardial Fluid	...	...	...	...	5
66.	Pituitary	...	...	...	...	2
67.	Retroperitoneal tissues	...	...	...	...	8
68.	Intra-Abdominal tissues	...	...	...	...	5
69.	Salivary gland	...	...	...	...	55
70.	Scrotum	...	...	...	...	21
71.	Skin and subcutaneous tissues	...	...	...	...	1,207
72.	Aspiration from skin and subcutaneous tissues	...	...	...	...	7
73.	Spleen	...	...	...	...	72
74.	Sputum	...	...	...	...	20
75.	Stomach	...	...	...	...	312
76.	Stomach contents	...	...	...	...	2
77.	Spinal cord	...	...	...	...	3
78.	Spermatic cord	...	...	...	...	1
79.	Testes, Epididymis and Vas deferens	...	...	...	...	39
80.	Thyroid Gland	...	...	...	...	163
81.	Aspiration from Thyroid gland	...	...	...	...	1
82.	Tongue	...	...	...	...	63
83.	Tonsils	...	...	...	...	30
84.	Trachea	...	...	...	...	5
85.	Thymus and Thoracic tissues	...	...	...	...	2
86.	Urethra	...	...	...	...	30
87.	Ureter	...	...	...	...	19
88.	Urine	...	...	...	...	6
89.	Uterus	...	...	...	...	301
90.	Umbilicus and cord	...	...	...	...	7
91.	Vagina	...	...	...	...	60
92.	Vaginal smear	...	...	...	...	1
93.	Vulva	...	...	...	...	39
94.	Worms	...	...	...	...	1
Total						15,427



Table 143

## AN ANALYSIS OF HISTOLOGICAL DIAGNOSIS

1964

1. *Inflammatory:*

(a) Acute Inflammation	...	...	...	568
(b) Acute and chronic (subacute inflammation)	...	...	...	107
(c) Chronic Inflammation	...	...	...	1,652
(d) Granulomatous Inflammation	...	...	...	445
(1) Tuberculosis	...	...	...	305
(2) Leprosy	...	...	...	138
(3) Filariasis	...	...	...	3
(4) Other Helminths	...	...	...	71
(5) Fungal	...	...	...	6
(e) Inflammation with Repair and/or Fibrosis	...	...	...	201
(f) Inflammation with Subsequent Morpho/Alteration	...	...	...	23
(g) Inflammation Superimposed on Morpho/Alteration	...	...	...	261
(h) Fibrosis and/or Repair	...	...	...	134

2. *Traumatic Abnormalities:*

(1) Effects of Surgical Procedures	...	...	...	4
(2) Wounds	...	...	...	42
(3) Fractures	...	...	...	1
(4) Miscellaneous	...	...	...	4
(5) Disorganisation	...	...	...	8

3. *Congenital Malformations:*

(1) Abnormalities of Pregnancy and POC	...	...	...	2,720
(2) Ectopic Pregnancy	...	...	...	112
(3) Malformations and Deformities of Parts of Body	...	...	...	17
(4) Congenital absence, accessory, supernumerary organs and tissues	...	...	...	8
(5) Estopis (Heterotopia)	...	...	...	3
(6) Intersex (8334-12133)	...	...	...	2

4. *Mechanical Abnormalities:*

(1) Foreign body	...	...	...	4
(2) Dilatation and Diverticula	...	...	...	73
(3) Retention of Contents (Cystic and noncystic)	...	...	...	309
(4) Obstruction, Stenosis, Thrombus and Embolus	...	...	...	106

5. *Degeneration, Necrosis and Deposition:*

(1) Degeneration which usually occurs in only one kind of tissue	...	...	...	57
(2) Necrosis	...	...	...	82
(3) Deposition	...	...	...	23
(4) Deposition of Pigments	...	...	...	25
(5) Collagen Disease	...	...	...	39

6. *Alteration of Growth and Atrophy:*

(1) Atrophy	...	...	...	42
(2) Dystrophy	...	...	...	2
(3) Hypertrophy	...	...	...	115
(4) Metaplasia with/without Atypia	...	...	...	118
(5) Dysplasia	...	...	...	23
(6) Hyperplasia with/without Atypia	...	...	...	529

7. *Neoplasia:*

(1) Tumours of Glandular Epithelium	...	...	(M)	603	(B)	330
(2) Tumours of Nonglandular Epithelium	...	...	(M)	1,072	(B)	157
(3) Leukaemia	...	...	(M)	10	(B)	—
(4) Lymphoma	...	...	(M)	50	(B)	1
(5) Tumours of Nervous tissues and Associated structures	...	...	(M)	20	(B)	53
(6) Tumours of Vascular tissues	...	...	(M)	1	(B)	136
(7) Tumours of Connective tissues and muscle	...	...	(M)	31	(B)	332
(8) Tumours of Non-epithelial tissues	...	...	(M)	16	(B)	19
(9) Tumours of Embryonal and mixed tissues	...	...	(M)	12	(B)	54

Table 144

## NEOPLASIA

				Malignant Tumours	Benign Tumours
1.	Anal and ischio-rectal tissues	...	...	84	19
2.	Appendix	...	...	3	—
3.	Ascitic fluid	...	...	12	*3
4.	Adrenals	...	...	—	3
5.	Ampulla of Vater	...	...	1	—
6.	Bladder and bladder washout	...	...	31	8
7.	Bones and aspiration from bones	...	...	21	12
8.	Bone marrow	...	...	5	—
9.	Brain and meninges	...	...	5	6
10.	Broad ligament and Parametrial tissues	...	...	—	3
11.	Breast and nipple discharge	...	...	77	77
12.	Bronchus	...	...	35	—
13.	Bronchial smears	...	...	9	*3
14.	Blood Films	...	...	—	3
15.	Cervix	...	...	156	58
16.	Colon and rectum	...	...	58	2
17.	Cerebro-spinal fluid	...	...	1	—
18.	Ear	...	...	4	17
19.	Endometrium	...	...	41	23
20.	Eye and eyelids, etc.	...	...	19	17
21.	Fallopian tube	...	...	1	1
22.	Gall bladder	...	...	5	—
23.	Intestines	...	...	6	6
24.	Joints and synovial tissues and aspiration joints	...	...	2	12
25.	Kidney	...	...	11	1
26.	Larynx	...	...	52	11
27.	Liver and aspiration liver	...	...	116	—
28.	Lung and aspiration lung	...	...	20	3
29.	Lymph node	...	...	203	—
30.	Mesentery	...	...	6	1
31.	Mouth and dental diseases	...	...	28	12
32.	Mediastinum	...	...	1	—
33.	Nerves and sympathetic ganglia	...	...	—	4
34.	Nose and nasopharynx and sinuses	...	...	182	27
35.	Oesophagus	...	...	105	—
36.	Omentum	...	...	24	—
37.	Ovary	...	...	40	114
38.	Palate	...	...	11	4
39.	Pancreas	...	...	3	—
40.	Parathyroid	...	...	1	—
41.	Penis	...	...	24	2
42.	Peritoneum	...	...	3	—
43.	Peritoneal fluid	...	...	4	—
44.	Pharynx	...	...	8	—
45.	Placenta	...	...	—	—
46.	Pleura	...	...	28	1
47.	Pleural fluid	...	...	42	*11
48.	Prostate	...	...	13	—
49.	Pus	...	...	1	—
50.	Pituitary	...	...	—	2
51.	Retroperitoneal tissues	...	...	3	—
52.	Intra-abdominal tissues	...	...	2	—
53.	Salivary gland	...	...	6	25
54.	Scrotum	...	...	2	1
55.	Skin and subcutaneous tissues	...	...	162	307
56.	Spleen	...	...	1	—
57.	Sputum	...	...	2	—
58.	Stomach	...	...	93	4
59.	Spinal cord	...	...	1	1
60.	Testes, Epididymis and Vas deferens	...	...	5	1

\* Probably malignant,

Table 145

POST MORTEM EXAMINATIONS  
1964

Total number of Necropsies	...	2661
(1) Coroner's Cases	...	1274

These necropsies were conducted by the Staff of the Government Department of Pathology.

(2) Hospital Cases	...	1387
--------------------	-----	------

AGE, SEX, RACE DISTRIBUTION OF AUTOPSIES ON ALL DEATHS  
CORONER'S AND WARD CASES 1964

Age		CHINESE		INDIANS		MALAYS		OTHERS		TOTAL		Grand Total
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Under 1 year	..	572	419	28	28	2	..	3	2	605	449	1,054
1 — 10	..	105	72	6	5	1	3	1	2	113	82	195
11 — 20	..	79	35	3	2	3	1	1	1	86	39	125
21 — 30	..	105	27	17	2	21	5	5	1	148	35	183
31 — 40	..	68	45	20	5	12	2	8	2	108	54	162
41 — 50	..	118	32	32	4	10	2	5	1	165	39	204
51 — 60	..	227	47	29	2	7	1	6	..	269	50	319
61 — 70	..	182	42	13	3	3	1	6	2	204	48	252
Over 70	..	81	26	6	..	2	..	4	..	93	26	119
Total	..	1,537	745	154	51	61	15	39	11	1,791	822	2,613
											Autopsies of unknown Cases .. + 48	
											Total .. 2,661	



Table 146

## DEATHS FROM VIOLENCE

1964

1.	Hanging	...	...	...	57
2.	Traumatic Asphyxia	...	...	...	1
3.	Strangulation	...	...	...	3
4.	Drowning	...	...	...	83
5.	Firearms	...	...	...	14
6.	Explosives	...	...	...	4
7.	Blast Injuries	...	...	...	1
8.	Cutting and Piercing Instruments	...	...	...	34
9.	Injuries by Blunt Instruments	...	...	...	20
10.	Train Accident	...	...	...	1
11.	Vehicle Accidents	...	...	...	247
12.	Fall from Heights	...	...	...	61
13.	Falls	...	...	...	30
14.	Injuries Unascertainable	...	...	...	10
15.	Decomposed Corpses and Human Remains	...	...	...	16
16.	Injuries by Falling objects	...	...	...	13
17.	Burns	...	...	...	2
18.	Scalds	...	...	...	2
19.	Choking	...	...	...	1
20.	Electrocution	...	...	...	7
21.	Lightning	...	...	...	1
22.	Suffocation	...	...	...	5
23.	Snakes and Insect Bites and Wasp stings	...	...	...	3
24.	Machinery	...	...	...	2
25.	Caisson Disease	...	...	...	3
26.	Fat Embolism	...	...	...	1
27.	Submersion	...	...	...	1
28.	Still Birth	...	...	...	215
Total					838

Table 147

## DEATHS FROM POISONING

1.	Caustic Soda	...	...	...	18
2.	Morphine	...	...	...	1
3.	Tuba Root	...	...	...	1
4.	Barbiturates	...	...	...	6
5.	Salicylate	...	...	...	1
6.	Largactil	...	...	...	2
7.	D.D.T.	...	...	...	2
8.	Diazinon	...	...	...	1
9.	Eucalyptus oil	...	...	...	1
10.	Malathion	...	...	...	1
Total					34

Table 148

## DEATHS FROM ILL-DEFINED CAUSES

1.	Post — operative	...	...	...	9
2.	Unestablished and obscure causes	...	...	...	10
Total					19

Table 149

## CAUSE GROUPS

1.	Tuberculosis: (1) Respiratory System	...	...	149
	(2) Meninges, Central Nervous System	...	...	5
	(3) Intestines, Peritoneum and Mesenteric glands	...	...	12
	(4) Bones and Joints	...	...	1
	(5) All other forms	...	...	35
			Total	202
2.	All other Syphilis	...	...	4
3.	Congenital Syphilis	...	...	2
4.	Cholera	...	...	1
5.	Dysentery -- All Forms: (1) Bacillary	...	...	1
	(2) Amœbic	...	...	4
6.	Septicæmia and Pyæmia	...	...	29
7.	Diphtheria	...	...	3
8.	Meningococcal Infections	...	...	1
9.	Leprosy	...	...	1
10.	Tetanus	...	...	7
11.	Acute Infectious Encephalitis	...	...	13
12.	Measles	...	...	3
13.	Infective Hepatitis	...	...	15
14.	Malaria	...	...	2
15.	Schistosomiasis	...	...	4
16.	Filariasis	...	...	1
17.	Leptospirosis	...	...	4
18.	All other Diseases Classified as Infective and Parasitic	...	...	3 (Clonorchis)
19.	Malignant Neoplasus:			
	(1) Buccal cavity and Pharynx	...	...	1
	(2) Oesophagus	...	...	15
	(3) Stomach	...	...	23
	(4) Intestines (except rectum)	...	...	8
	(5) Rectum	...	...	2
	(6) Larynx	...	...	2
	(7) Trachea, Bronchus and Lung	...	...	63
	(8) Breast	...	...	2
	(9) Cervix uteri	...	...	4
	(10) Other and unspecified parts of uterus	...	...	5
	(11) Prostate	...	...	2
	(12) Bone and Connective tissues	...	...	9
	(13) Others and Unspecified sites	...	...	126
	(14) Leukæmia and Aleukæmia	...	...	8
	(15) Lymphosarcoma and other Neoplasms of Lymphatic and Hæmopoetic Systems	...	...	7
			Total	277
20.	Benign Neoplasms and Neoplasms of Unspecified nature	...	...	55
21.	Non-toxic Goitre	...	...	4
22.	Thyrotoxicosis with/without Goitre	...	...	3
23.	Diabetes Mellitus	...	...	10
24.	Avitaminosis and other Deficiency States	...	...	19
25.	Anæmias	...	...	8
26.	Allergic Disorders, All other endocrine, Metabolic and Blood disease	...	...	3
27.	Vascular Lesions affecting Central Nervous System (Intraventricular Hæm.)	...	...	197
28.	Non-Meningococcal Meningitis	...	...	49
29.	Epilepsy	...	...	2
30.	All other Diseases of the Nervous System and sense organs	...	...	93
31.	Chronic Rheumatic Heart Disease	...	...	7
32.	Arteriosclerotic and Degenerative Heart Disease (Heart Failure)	...	...	84



Table 149 — *continued*

33.	Other Diseases of Heart	...	...	269
34.	Hypertension with Heart Disease	...	...	20
35.	Hypertension without mention of Heart	...	...	17
36.	Diseases of Arteries	...	...	264
37.	Lobar Pneumonia	...	...	31
38.	Broncho-Pneumonia	...	...	572
39.	Primary, Atypical, other and Unspecified Pneumonia	...	...	102
40.	Acute Bronchitis	...	...	5
41.	Bronchitis, chronic and unspecified	...	...	30
42.	Hypertrophy of Tonsils and adenoids	...	...	1
43.	Empyema and Abscess Lung	...	...	40
44.	Pleurisy	...	...	2
45.	All other Respiratory Diseases	...	...	232
46.	Pulmonary Hæmorrhage	...	...	95
47.	Ulcer Stomach	...	...	36
48.	Ulcer Duodenum	...	...	12
49.	Gastritis and Duodenitis	...	...	2
50.	Appendicitis	...	...	5
51.	Intestinal Obstruction and Hernia	...	...	18
52.	Gastro-enteritis and Colitis, except Diarrhœa of Newborn	...	...	77
53.	Cirrhosis of Liver	...	...	50
54.	Cholelithiasis and Cholecystitis	...	...	28
55.	Other Diseases of Digestive System	...	...	114
56.	Acute Nephritis	...	...	1
57.	Chronic, other and Unspecified Nephritis	...	...	116
58.	Calculi of Urinary System	...	...	2
59.	Hyperplasia of Prostate	...	...	57
60.	Other Diseases of genito-urinary system	...	...	165
61.	Toxæmias of Pregnancy and The Puerperium	...	...	5
62.	Hæmorrhage of Pregnancy and childbirth	...	...	3
63.	Abortion without mention of Sepsis and Toxæmia	...	...	2
64.	Abortion with Sepsis	...	...	8
65.	Other complications of Pregnancy, childbirth and Puerperium	...	...	1
66.	Infections of skin and subcutaneous tissues	...	...	3
67.	Osteomyelitis and Periostitis	...	...	3
68.	Ankylosis and acquired Musculo-skeletal Deformities	...	...	1
69.	All other Diseases of skin and Musculo-skeletal system	...	...	3
70.	Spina-Bifida and Meningocœle	...	...	3
71.	Congenital Malformations of Circulatory System, (Congenital Heart Disease)	...	...	77
72.	All other Congenital Malformations	...	...	54
73.	Post-natal Asphyxia and Atelectasis (Pulmonary)	...	...	386
74.	Hæmolytic Disease of the New-Born	...	...	44
75.	Ill-defined Diseases peculiar to Early Infancy, and Immaturity Unqualified (Prematurity)	...	...	580
76.	Fatty Liver	...	...	113
77.	Peritonitis	...	...	61
78.	Hirschprung's Disease	...	...	4
79.	Acute Hæmorrhagic Pancreatitis	...	...	6
80.	Fungal Infections (Cryptococcosis — Brain)	...	...	3
81.	Beri-Beri	...	...	1
82.	Thrombocytopæmic Purpura	...	...	1
83.	Hæmorrhagic Fevers	...	...	15
84.	Gas Gangrene	...	...	1
85.	Wilson's Disease	...	...	1
86.	Hæmochromatosis	...	...	2
87.	Intussusception	...	...	2

## BACTERIOLOGY SECTION

The Bacteriology Section occupies the ground floor of the Department of Pathology. It consists of three routine laboratories, two research laboratories cum office for Bacteriologist and Assistant Bacteriologists, and two Virology laboratories. Also one media room, one sterilization room, one glassware preparation room, one washing room, and one animal inoculation room.

*Staff*

Medical Officer	...	...	1 (on scholarship for Dip. Bact.)
Medical Officer	...	...	1
Science Graduate in Bacteriology	...	...	1
Senior Laboratory Technician	...	...	1
Qualified Laboratory Technicians	...	...	8
Technicians-in-training	...	...	6-8 (Number is variable)
Laboratory attendants	...	...	10

The average number of examinations carried out by each member of staff was 14,500.

## BACTERIOLOGY

Total number of Bacteriological investigations	...	...	264,383
Total amount of media prepared	...	...	6,436,000 cc
1. Throat Swab for Culture	...	...	3,774
<i>Organisms isolated</i>			
Corynebacterium diphtheriae	...	...	40
Streptococcus haemolyticus	...	...	237
Staphylococcus aureus	...	...	629
Monilia	...	...	196
Klebsiella pneumonia	...	...	28
Other organisms	...	...	89
2. Nasal Swabs for Culture	...	...	587
<i>Organisms isolated</i>			
Corynebacterium diphtheriae	...	...	8
Streptococcus haemolyticus	...	...	15
Staphylococcus aureus	...	...	144
Monilia	...	...	5
Klebsiella pneumonia	...	...	3
Other organisms	...	...	11
3. Sputum for Culture	...	...	3,216
<i>Organisms isolated</i>			
Beta haemolytic streptococcus	...	...	61
Staphylococcus aureus (Coagulase + Ve)	...	...	202
B. friedlander	...	...	61
Candida sp.	...	...	41
B. coli	...	...	36
Ps. pyocyanea	...	...	258
B. proteus	...	...	58
Strept. pneumococcus	...	...	Nil
Aerogenic E. coli	...	...	1
Aerobacter aerogenes	...	...	60



## 4. Ear Swab and Pus for Culture ... 5,254

*Organisms isolated*

Beta haemolytic streptococcus	...	328
Alpha streptococcus	...	47
Non Haemolytic streptococcus	...	Nil
Staphylococcus aureus (coagulase + Ve)	...	1,977
Strept. pneumococcus	...	3
Ps. Pyocyanea	...	831
B. proteus	...	468
Enterococcus	...	12
B. coli	...	552
B. coli areogenes	...	446
Actinomyces sp.	...	Nil
Paracolon	...	48
Salmonella typhi	...	1
Candida sp.	...	24
B. friedlander	...	1
C. diphtheriae	...	3
Cl. nelchii	...	10
Staphylococcus albus	...	43
Anaerogenic E. coli	...	4
B. alkaligenes	...	71
Anaerobic strep.	...	1
Cl. tetani	...	1
G.C.	...	1
Anaerobic spore-bearer	...	6
Anaerobic H.S.	...	1

## 5. Pleural and other Fluids for Culture ... 831

*Organisms isolated*

Beta haemolytic streptococcus	...	8
Streptococcus faecalis	...	3
Staphylococcus aureus (Coagulase + ve)	...	45
Streptococcus pneumoniae	...	1
Ps. Pyocyanea	...	18
B. Proteus	...	4
B. coli	...	12
Salmonella group	...	Nil
Aerobacter aerogenes	...	19
B. alkaligenes	...	7
Staphylococcus albus	...	5
Alpha streptococcus	...	6
Monilia	...	1

## 6. Cerebral Spinal Fluid for Culture ... 1,091

*Organisms isolated*

Cryptococcus	...	13
Beta haemolytic streptococcus	...	2
Alpha haemolytic streptococcus	...	2
Meningococcus	...	1
Stept. pneumococcus	...	7
Staphylococcus aureus (coagulase + ve)	...	21
B. coli	...	9
Ps. pyocyanae	...	4
Aerobacter aerogenes	...	10
Staphylococcus albus	...	4
B. proteus	...	3

## 7. Vaginal, Cervical, Urthral Swab for Culture ... 2,665

*Organisms isolated*

Beta haemolytic streptococcus	...	79
Alpha haemolytic streptococcus	...	110
Staphylococcus aureus (Coagulase + ve)	...	305
N. gonorrhoeae	...	18
Cl. welchii	...	5
Enterococcus	...	14
B. proteus	...	65
Ps. pyocyanea	...	65
B. coli	...	56
Candida sp.	...	394
Paracolon	...	37
Aerobacter aerogenes	...	128
Anaerogenic E. coli	...	5
Staphylococcus albus	...	9
B. alkaligenes	...	10

## 8. Eye Swab for Culture ... 1,310

*Organisms isolated*

Beta haemolytic streptococcus	...	21
Streptococcus pneumoniae	...	3
Staphylococcus aureus (Coagulase + ve)	...	85
B. Proteus	...	13
Ps. Pyocyanea	...	73
B. Coli aerogenes	...	18
B. Alkaligenes	...	7
Alpha streptococcus	...	14
Staphylococcus albus	...	8
Diphtheroids	...	5
B. Paracolon	...	7
Anaerogenic B. Coli	...	1

## 9. Urine for Culture ... 8,837

*Organisms isolated*

B. Coli	...	2,381
B. Coli aerogenes	...	2,050
B. Proteus	...	1,211
Enterococcus	...	714
Ps. Pyocyanea	...	704
Non haemolytic streptococcus	...	315
Staphylococcus aureus (Coagulase + ve)	...	285
Alpha haemolytic streptococcus	...	111
Beta haemolytic streptococcus	...	7

## 10. Stool for Culture ... 6,222

*Organisms isolated*

Vibrio Cholerae	...	31
Pathogenic B. Coli	...	208
Shigella flexneri	...	19
Shigella sonnei	...	11
Salmonella typhi	...	8
Salmonella group B	...	7
Salmonella group C	...	6
Salmonella group E	...	8
Salmonella group (unidentified)	...	6
Salmonella typhimurium	...	2
Salmonella newport	...	2
Salmonella thompson	...	1



11. Blood (including blood clot) for Culture	...	...	5,158
<i>Organisms isolated</i>			
Salmonella typhi	...	...	68
Staphylococcus aureus	...	...	103
Beta haemolytic streptococcus	...	...	33
Streptococcus viridans	...	...	5
Pseudomonas pyocyanea	...	...	27
B. Alkaligenes	...	...	193
12. Miscellaneous Specimens for Culture	...	...	332
	Total No. of Specimens	Organisms isolated	
(a) Bile	...	...	54
		Salmonella typhi	...
		B. coli	...
		B. proteus	...
		B. paracolon	...
		A. aerogenes	...
		Monilia	...
(b) Bone	...	---	45
(c) Biopsy tissue	...	Staphylococcus aureus	...
		B. coli	...
		Anaerobic spore bearing organism	...
		B. proteus	...
(d) P. M. organs	...	B. coli	...
		A. aerogenes	...
(e) Food specimens	...	Staphylococcus aureus	...
(f) Stomach contents	...	Staphylococcus aureus	...
		B. coli	...
		Streptococcus faecalis	...
		A. aerogenes	...
(g) Dressings	...	---	2
(h) Theatre air samples	...	Staphylococcus	...
		B. subtilis	...
(i) B. subtilis cultures	...		23
(j) Cough and Finger Print Plates	...		10
13. Serological Examination	...	...	6,359
	Blood for Widal	...	1,635
	Blood for Weil Felix	...	1,635
	Blood for V1 agglutination	...	26
	Blood for Brucella agglutination	...	30
	Blood for Paul Bunnell		134
	Sensitized Erythrocytes Lysis Test (SEL)	...	596
	C Reactive Protein test		755
	Antistreptolysin "O" test		1,267
	Antithyroid antibodies	...	241
	Aga gel diffusion tests for Drug Sensitivity	...	36
	Blood for Cholera antibodies	...	4

14. Medico Legal Specimen Examination	...	...	280
Urethral Swabs	...	...	116
Vaginal Swabs	...	...	87
Prostatic Swabs	...	...	36
Mouth Swab	...	...	1
Urine for Pregnancy test	...	...	40
15. Culture for Amoeba and Intestinal Parasites	...	...	2,210
Specimens		Total	
(1) Stool	...	...	2,088
(2) Rectal Swab	...	...	12
(3) Pus from Liver and other sources	...	...	55
(4) P. M. specimens	...	...	7
(5) Miscellaneous	.....	...	48

POSITIVE M. E.

	E. Histolytica Trophozoites or Cysts	Giardia Lamblia	Trichomonas Intestinalis	Balantidium Coli
(1) Stool .. ..	82	75	14	1
(2) Rectal Swab ..	..	..	..	..
(3) Pus from Liver and other Sources ..	3	..	..	..
(4) P. M. Specimen ..	..	..	..	..
(5) Miscellaneous ..	..	..	..	..

POSITIVE CULTURES

	E. Histo- lytica	E. H. Small- race	E. Coli	Dient- amoeba Fragilis	E. Nana	Balanti- dium Coli	Trich. Intest.
(1) Stool .. ..	180	66	10	10	46	1	59
(2) Rectal Swab ..	..	..	..	..	..	..	..
(3) Pus from Liver and other Sources ..	4	..	..	..	..	..	..
(4) P. M. Specimen ..	..	..	..	..	..	..	..
(5) Miscellaneous ..	1	..	..	..	..	..	..



16. Mycological Investigations	...	...	...	3,921
			Total No.	
(a) Cultures for Fungi (See Appendix A)	...	...	1,156	
(b) Direct M.E. for Fungi	...	...	1,156	
(c) Sensivity Tests for Fungi	...	...	1,330	
(d) Bio-chemical reactions	...	...	279	
17. Sensitivity Tests	...	...	...	209,848
Penicillin.			Erythromycin.	
Streptomycin.			Sigmamycin.	
Chloromphenicol.			DMC Tetracycline (Ledermycin).	
Tetracycline Hyd.			Furadantin.	
Oxytetracycline.			Bacitracin.	
Trisulfonamide.			Framygen.	
Neomycin.			Polymixin.	
Spiramycin.			Rifocin.	
Kanamycin.				
18. Culture for Leptospira				
	Urine	...	27	
	Blood	...	18	
				45
19. Animal Inoculation	...	...	...	33
(a) Tuberculosis — CSF	...	...	1	
Urine	...	...	1	
Sputum	...	...	1	
Pleural fluid	...	...	3	
Miscellaneous	...	...	8	
(b) Leptospirosis	...	...	1	
(c) Experimental Inoculation	...	...	18	
	Rabbit	Guinea Pig	Mice	Hamster
Tetanus	...	—	5	—
Friedlanders' Bacillus	—	—	5	—
Toxoplasmosis	...	—	1	—
Erysipelothrix	...	—	1	—
Pasteurella pestis	...	1	3	—
Parvobacterium	...	—	1	—
Entomoeba histolytica	—	—	—	1
20. Standardization of Drugs and Sterility Test of Biological Preparation etc.	...	...	...	1,658
(a) Sterility Tests				
Biological preparations	...	...	1,071	
Surgical dressings and instruments etc		...	153	
Blood and plasma (from B.T.S.)	...	...	380	
Bone (from bone bank)	...	...	5	
(b) Potency tests of antibiotic preparations		...	43	
(c) Phenol coefficient of Disinfectants		...	4	
(d) Disinfectant Potency against coliforms		...	2	
21. Toad Test for Pregnancy	...	...	...	685
	Positive	...	253	
	Negative	...	432	

22.	Clinical Examinations	...	...	...	68
	Blood M.E.	...	1		
	Blood count	...	1		
	Stool	...	8		
	Stool occult blood	...	1		
	Urine	...	3		
	Dark ground	...	54		
23.	Preparation of Vaccine				
	T.A.B. Vaccine (Prophylactic)	...	6,600 c.c.		
	Autogenous Vaccine	...	40 c.c.		
	Tobacco Allergen	...	120 c.c.		
24.	Preparation of Agglutinable Suspensions	...	5,200 c.c.		
	Salmonella typhi "H" concentrated	...	600 c.c.		
	Salmonella typhi "O" concentrated	...	600 c.c.		
	Salmonella paratyphi "AH" concentrated	...	500 c.c.		
	Salmonella paratyphi "AO" concentrated	...	500 c.c.		
	Salmonella paratyphi "BH" concentrated	...	500 c.c.		
	Salmonella paratyphi "BO" concentrated	...	500 c.c.		
	Salmonella paratyphi "CH" concentrated	...	500 c.c.		
	Salmonella paratyphi "CO" concentrated	...	500 c.c.		
	Proteus OXK	...	500 c.c.		
	Proteus OX19	...	500 c.c.		
25.	Media Preparation	See Table 151			
26.	Preparation of Antibiotic Discs	...	2,098,000		
	Penicillin, Streptomycin, Chloramphenicol, Tetracycline Hyd., Oxytetracycline, Trisulfonamide, Neomycin, Spiramycin, Kanamycin, Erythromycin, Sigmamycin, DMC Tetracycline Bacitracin, Polymixin.				
27.	Maintenance of Stock Cultures	...	226		
	1. Fungi: dermatophytes, candida	...	110		
	2. Salmonella and Shigella	...	28		
	3. Leptospira	...	6		
	4. V. Cholera	...	6		
	5. V. Cholera el Tor strains	...	58		
	6. Pathogenic B. coli	...	2		
	7. Brucella	...	3		
	8. Clostridium	...	2		
	9. Proteus	...	2		
	10. Staphylococcus aureus	...	1		
	11. Bacillus subtilis	...	1		
	12. Klebsiella friedlander	...	1		
	13. Entamoeba histolytica	...	6		
28.	Dr. J. Stein continued his term as Bacteriologist until July 1964.				



During this time there were two further outbreaks of cholera cases. In January and February 1964, the third cholera outbreak in Singapore occurred, when three cases of cholera were diagnosed.

From April until June 1964, the fourth outbreak occurred, when 20 cases were isolated. Out of these, there were three deaths. Seven carrier cases were discovered on examination of contacts.

In August, one case of cholera was confirmed. During the year a total of 2,370 stool specimens were examined for cholera.

### *Virology Laboratory*

Previous conditions for Virology work were unsatisfactory due to the fact that this work, which requires the highest standards of cleanliness and bacteriological sterility, was being carried out in a room serving as an office and bacteriology laboratory.

However, during 1964, two rooms, previously housing animals for Bacteriology work, were converted into Virology laboratories, and the animals transferred to a new animal room converted from an unused corridor.

The Virology equipment, purchased the previous year 1963, has been installed into the new laboratories and work will commence in 1965.

### *Amoeba Cultures*

During the month of December, and extending into January 1965, in addition to routine specimens, a further 253 stool specimens were examined for *Entamoeba histolytica*. These specimens were from children and staff of Girls' Homecraft Centre following the discovery of Amoebic Dysentery in children recently entering the home. *Entamoeba histolytica* was isolated from six specimens, *E. H.* (smallrace) from 35 specimens and *Giardia lamblia* seen in 23 specimens.

### *Theatre Sterility*

Another field in which preliminary work has been carried out is the theatres of General Hospital and Thomson Road Hospital. Here investigation into pathogenic bacteria present in the air in theatres, and tests to determine the sterility of autoclaved articles to be used in theatres has been done.

Continuous supervision and testing of autoclaves serving operating theatres is essential, and the laboratory is ready to assume this responsibility.

However, with the increasing demands on Bacteriology, the laboratory is finding it difficult with shortage of staff and limited budget to meet these new responsibilities.

The number of routine tests increases year by year, and in 1964, the total number of specimens has increased by 70,802 to 262,680.

Again this year there has been no increase in staff. The trainees do a large section of the practical work. We depend on them so much for routine work that if less than the usual number of trainees are allotted to the laboratory, it is difficult to complete the work.

The staff responded very well during the emergency conditions — July and September, when although many routine specimens were suspended, staff arrived during non curfew hours to complete necessary investigations.

In June 1964, Dr. Moses Yu obtained his Diploma in Bacteriology and has since done work in Mycology and Virology.

He will be returning to the Department in March 1965.

Table 150

MYCOLOGY SECTION  
STRAINS OF FUNGI ISOLATED

		Skin Scrap- pings	Sputum	Nails	Pus	Other Sources	Total
No. of Specimens ..	..	127	267	29	12	142	578
Trichophyton Tonsurans ..	..	3	..	1	..	..	4
Trichophyton Rubrum ..	..	1	..	..	..	..	1
Trichophyton Gypseum ..	..	3	..	..	..	..	3
Trichophyton Verrucosum ..	..	2	..	..	..	..	2
Microsporum Canis ..	..	4	..	..	..	..	4
Epidermophyton Floccosum ..	..	1	..	..	..	..	1
Gladosporium Species ..	..	1	..	..	..	..	1
Tinea Vesicolor ..	..	1	..	..	..	..	1
Hormodendrum Species ..	..	7	..	3	..	..	10
Cryptococcus Neoformans ..	..	..	..	..	..	CSF 13	13
Candida Albicans ..	..	..	3	..	..	..	3
Candida Tropicalis ..	..	5	18	1	1	4	29
Candida Krusei ..	..	2	9	2	1	2	16
Candida Parakrusei ..	..	11	30	5	3	8	57
Candida Stellatoidea ..	..	11	113	3	2	6	135
Candida Guilliermondi ..	..	4	1	..	..	..	5
Candida Species ..	..	11	12	10	..	1	34
Geotrichum Candidum ..	..	8	4	1	1	..	14
Aspergillus Niger ..	..	5	3	2	1	1	12
Aspergillus Fumigatus ..	..	3	1	..	1	1	6
Aspergillus Species ..	..	3	2	1	..	1	7
Helminthosporium ..	..	5	1	..	..	1	7
Penicillium Species ..	..	9	4	..	1	2	16
Phialophora Verrucosa ..	..	1	..	..	..	1	2
						(hair)	
Black Yeast ..	..	1	..	..	..	..	1
Red Yeast ..	..	2	..	1	..	..	3
Fusarium ..	..	..	1	..	..	..	1
Monosporium Apiospermum ..	..	..	..	1	..	..	1
Phoma ..	..	..	..	..	..	1	1
Sensitivity Tests ..	..	1,330	..	..	..	..	..



Table 151

<i>Agar Media:</i>	Nutrient Agar	...	...	2,290,000 c.c.
	Blood plate	...	...	1,860,000 c.c.
	EMB	...	...	425,000 c.c.
	Chocolate plate	...	...	14,500 c.c.
	Chlamydospore agar	...	...	10,000 c.c.
	Kliger agar	...	...	61,000 c.c.
	Sabouraud agar	...	...	50,000 c.c.
	Total	...		4,710,500 c.c.
<i>Broth Media:</i>	Brewer's broth	...	...	35,000 c.c.
	BCT	...	...	9,000 c.c.
	Blood culture broth	...	...	247,000 c.c.
	Filde's broth	...	...	120,000 c.c.
	Hartley's broth	...	...	200,000 c.c.
	Koser's citrate	...	...	60,000 c.c.
	Nutrient broth	...	...	280,000 c.c.
	Ox gall broth	...	...	10,000 c.c.
	Sabouraud broth	...	...	8,000 c.c.
	SF broth	...	...	12,000 c.c.
	Sod. taurocholate broth 10%	...	...	10,000 c.c.
	Selenite F broth	...	...	55,000 c.c.
	Stuart's medium	...	...	20,000 c.c.
	Tryptone 1% broth	...	...	14,000 c.c.
	Tetrathionate broth	...	...	60,000 c.c.
	UMI broth	...	...	17,000 c.c.
	Miscellaneous media	...	...	50,000 c.c.
	Total	...		1,207,000 c.c.
<i>Meat Media:</i>	Robertson's media	...	...	88,000 c.c.
<i>Serum Media:</i>	Amœba medium	...	...	24,000 c.c.
	Hiss serum base broth	...	...	7,000 c.c.
	Loeffler slope medium	...	...	6,000 c.c.
	Hiss serum glucose	...	...	1,000 c.c.
	Hiss serum dextrin	...	...	1,000 c.c.
	Hiss serum maltose	...	...	1,000 c.c.
	Hiss serum starch	...	...	1,000 c.c.
	Hiss serum sucrose	...	...	1,000 c.c.
	Total	...		42,000 c.c.
<i>Sugar Media:</i>	Plain peptone broth	...	...	40,000 c.c.
	Glucose peptone broth	...	...	7,000 c.c.
	Lactose peptone broth	...	...	7,000 c.c.
	Maltose peptone broth	...	...	7,000 c.c.
	Mannite peptone broth	...	...	7,000 c.c.
	Sucrose peptone broth	...	...	7,000 c.c.
	Total	...		75,000 c.c.
<i>Saline:</i>	Physiological saline	...	...	200,000 c.c.
	Buffer saline	...	...	114,000 c.c.
	Total	...		314,000 c.c.

## BACTERIOLOGICAL LABORATORY, CITY HALL

The following is the report on the work done in the Bacteriological Laboratory, City Hall, Singapore, during the year 1964.

	1963	1964
<i>Public Health Specimens</i>		
1. From Health Officers ... ..	3,690	2,373
2. From M.O. i/c Staff ... ..	1,740	1,689
3. From M.O. i/c Outdoor Dispensaries ...	258	96
4. From Cleansing Department ... ..	31	46
5. From Sewerage Department ... ..	18	25
6. From Maternity and Infant Welfare Clinics ...	3,964	9,083
7. From Middleton Hospital ... ..	31,877	26,663
8. From Johore and Tebrau Water Works ...	225	—
9. From Private Practitioners ... ..	1,350	434
10. From Others, (Cold Storage Creameries, and other Manufacturers) ... ..	197	181
11. Special specimens for Virulence tests, Amoebae cultures, Diphtheria Confirmatory tests, etc. ...	4,171	2,236
12. Rats from Plague Prevention Department ...	3,290	2,940
13. Ecto-parasites from Plague Prevention Dept. ...	2,535	2,115
	<hr/> 53,346	<hr/> 47,881
<i>Water Samples</i>		
14. Public Utilities Board (Water Department) ...	11,793	12,469
15. Public Swimming Pools ... ..	4,572	3,894
16. Miscellaneous Sources ... ..	418	470
17. Algae and other samples ... ..	129	105
	<hr/>	<hr/>
Total ...	70,258	64,819

The shortage of staff has compelled this laboratory to curtail certain examinations. The examination of faeces for ova was resumed sometime in March 1964 giving the increase of specimens from 3,964 to 9,083 from the M.I.W. Clinics. There were two periods of civil disturbances during the year when curfew had to be imposed. This produced a drop in the number of specimens received.

*Malaria*.—280 blood films were examined for malarial parasites. Only one was found to be positive (*Plasmodium vivax* parasites).

*Tuberculosis*.—76 specimens were examined.

	Positive	Negative	Total
1. Sputum ... ..	1	42	43
2. Milk ... ..	—	33	33
	<hr/> 1	<hr/> 75	<hr/> 76

*Salmonella*

			Positive	Negative	Total
Faeces for Culture ...	...	...	293	5,468	5,761
(S. typhi isolated		166)			
(S. Para typhi "A" isolated		2)			
(S. Para typhi "B" isolated		15)			
(S. typhi-murium isolated		26)			
(S. Group "B" isolated		37)			
(S. Group "C" isolated		32)			
(S. Group "D" isolated		2)			
(S. Group "E" isolated		13)			
Urine for Culture ...	...	...	1	1,444	1,445
(S. typhi isolated		1)			
	Total	...	294	6,912	7,206

*Salmonella (Widal Reaction)*

Agglutination with Sal. typhi ...	...	87	634	721
Agglutination with Salpara typhi A	...	—	373	373
Agglutination with Salpara typhi B	...	3	370	373
Agglutination with Salpara typhi C	...	6	367	373
Blood clot Culture ...	...	51	322	373
(S. typhi isolated	49)			
(S. Paratyphi "A" isolated	1)			
(S. Group "C"	1)			
Agglutination with Vi Antigen ...	...	43	678	721

*Typhus (Well Felix Reaction)*

Agglutination with B. proteus OXK	...	—	370	370
Agglutination with B. proteus OX19	...	—	370	370
	Total	...	190	3,484
				3,674

A total of 348 persons were examined for typhoid-carrier state and from each case three specimens were examined—blood, faeces and urine.

*Amæbic Dysentery*.—4,152 specimens of faeces were examined for amœbæ.

E. histolytica was present in 80 specimens  
 E. Coli was present in 6 specimens  
 Negative 4,066 specimens

Total ... 4,152 specimens

*Shigella*.—5,761 specimens of faeces were cultured.

Shigella flexneri was isolated in	...	158 cases
Shigella sonnei was isolated in	...	107 cases
Shigella shiga was isolated in	...	1 case
Shigella boydii was isolated in	...	1 case
Shigella flexneri and sonnei (mixed infection) was isolated in	...	1 case
Negative	...	5,493 cases
	Total	...
		5,761 cases



*V. Cholera*

		Positive	Negative	Total
1. Faeces	...	27	229	256
2. Water	...	—	13	13
3. Fresh Prawns	...	—	1	1
4. Cockles	...	—	6	6
		—	—	—
Total	...	27	249	276
		—	—	—

Out of the 276 specimens, 256 specimens were from human sources.

There were three outbreaks of Cholera in Singapore in January, April and August 1964 respectively. Specimens of faeces were collected from suspected cases of Cholera and from contacts of diagnosed cases. The positives were all of the E1 Tor variety.

*Faeces for Ova and Intestinal Parasites.*—In 3,939 specimens ova were present, 7,964 being negative in a total of 11,802 specimens received. Multiple infestation was fairly common.

Ankylostome ova found in	...	947
Ascaris ova found in	...	1,815
Trichuris ova found in	...	2,095
Oxyuris ova found in	...	46
Strongyloides Larva found in	...	13
Lambliia cysts	...	126
Trichomonas	...	27
Balantidium	...	2
Hymenolepsis	...	1

*Diphtheria.*—There was a further drop in the number of specimens in 1964, (from 18,522 specimens in 1962 to 8,154 specimens in 1963 and 4,154 specimens in 1964). The compulsory diphtheria immunisation of infants since early 1962 may be showing its protective effect now.

		Positive		Negative		Total	
		1963	1964	1963	1964	1963	1964
1. Throat Swabs	...	607	253	5,705	3,246	6,312	3,499
2. Nasal Swabs	...	151	62	820	607	971	669
3. Ear Swabs	...	65	15	585	287	650	302
4. Sore Swabs, etc.	...	32	13	189	96	221	109
		—	—	—	—	—	—
Total	...	855	343	7,299	4,236	8,154	4,579
		—	—	—	—	—	—

*Miscellaneous Examinations:*

1. Urine/Pus for Gonococci (25 positive)	...	...	345
2. Blood for Total White Cell Count	...	...	133
3. Blood for Differential Count	...	...	136
4. Blood for Haemoglobin estimation	...	...	7
5. Blood for Sedimentation rate	...	...	39
6. Blood for Microfilaria	...	...	2
7. Blood for Salmonella	...	...	2
8. Pathological exudates for General Examination	...	...	1
9. Urine for General Examination	...	...	2,256
10. Faeces for Occult blood	...	...	2
11. Faeces for Food Poisoning	...	...	1
12. Sundried Humus and Sludge	...	...	36
13. Wash Water from Nightsoil Pails	...	...	35
14. Contents from Chemical Closets of Aircrafts	...	...	456
15. Aerated Water	...	...	3
16. Still Drinks	...	...	16
17. Ice Cream, Popsicles, etc.	...	...	640
18. Milk and Milk Products	...	...	98
19. Condensed Milk	...	...	4
20. Bottles for Sterility Tests	...	...	12
21. Cooked Food	...	...	8
22. Canned Food (Mushroom, Ham, Vegetable, Kaya, Butter etc.)	...	...	33
23. Sweets	...	...	1
24. Raw Fish	...	...	1
25. Dried Prawn	...	...	3
26. Water for Salmonella	...	...	3

Biochemical tests, faeces for Pathogenic E. Coli and sensitivity tests to antibiotics were not done due to the acute shortage of staff.

*Plague.*—2,940 rats were dissected; none of them showed any signs of plague infection.

2,115 ecto-parasites were combed out from the rats and examined.

The species and distribution of the rats and ecto-parasites are given in the attached table.

Internal organs from 103 rats, 46 live rats and also three gassed rats were collected by a research student from the Department of Zoology, University of Singapore.

Six live rats, infected with *Trypanosoma lewisi* were sent to the Department of Parasitology, and another five to the Department of Zoology, University of Singapore.

Five live rats were given to the Hygiene Section, R.A.F. Tengah, Singapore.

These 62 live rats and the three gassed rats are not included in the figures mentioned above.

*Water Samples.*—The condition of tap water was satisfactory throughout the year.

Samples received from sources other than the Water Department of the Public Utilities Board and the public swimming pools were as follows:

Singapore Swimming Club	...	...	200
Tanglin Club	...	...	80
Chinese Swimming Club	...	...	45
Connell House	...	...	21
Singapore Island Country Club		...	27
American Club	...	...	14
Other sources	...	...	83

Space in the incubators and waterbaths is inadequate to meet present-day requirements. Had more space been available in them more samples of water from the Public Utilities Board could have been accepted for examination and the revenue therefrom increased. The position is likely to become even worse when Johore River Scheme of the Water Department goes into full operation.

*Staff.*—The staffing position remained very unsatisfactory. There were only four technical staff, in an establishment total of seven, except in October and November when Miss Lam was posted here as a Bacteriologist. Towards the end of the year two persons were recruited to fill the vacancies of Technicians. Since then they were away for training.

In spite of such shortage efforts were made to carry out the more important work of the laboratory with as much efficiency and promptness as was possible in the circumstance. The co-operation and diligence of the technical staff are very much appreciated.

Laboratory technicians under training continued to be sent here for periods of two to four weeks for training in Public Health Bacteriology.



## PLAGUE PREVENTION

The following is a return of Rats caught for the year 1964

Source	R Norvegicus		R Rattus		R Concolor		M Musculus		Croci- dura	Total Rats	Total Preg. Rats	Total Dead Rats	Fleas X. Cheo- pies	Fleas Others	Total Fleas	Mite	T. Lewisi		Average Fleas Live per rat	Remarks
	M.	F.	M.	F.	M.	F.	M.	F.									+	-		
City Health	602	975	12	21	140	215	20	22	13	2,020	136	11	1,754	..	1,754	98	..	..	0.87	
Gcvt. Health	6	25	46	73	28	31	39	72	19	339	8	97	118	..	118	97	..	..	0.49	
S.H.B.	22	56	42	106	4	7	..	..	..	237	4	..	36	..	36	12	..	..	0.15	
Ships ..	2	3	13	20	..	..	130	176	..	344	11	344	..	..	..	..	..	..	..	Fumigate HCN
Total ..	632	1,059	113	220	172	253	189	270	32	2,940	159	452	1,908	..	1,908	207	..	..		
Grand Total ..	1,691		333		425		459		32	2,940	159	452	1,908	..	1,908	207	..			
Pregnant Rats ..	..	134	..	9	..	7	..	9	..	..	159	..	..	..	..	..	..	..		

All the Rats were dissected and none were found infected with Plague.

Remarks: (1) Internal organs from one hundred and three (103) rats, forty-six live rats and three gassed rats were collected by Miss S. K. Gatha of the Department of Zoology, University of Singapore.

(2) Six live rats infected with T. Lewisi were sent to the Department of Parasitology, University of Singapore.

(3) Five live rats infected with T. Lewisi were sent to the Department of Zoology, University of Singapore.

(4) Five live rats were supplied to Hygiene Section, R.A.F. Tengah, Singapore. Sixty-two (62) live rats and three (3) gassed rats are not included in the above totals.

## SEROLOGY

## ANNUAL RETURN FOR THE YEAR 1964

Total number of tests performed on Blood and C.S.F.					=	95,578
<i>Blood</i>						
V.D.R.L. Test (Qualitative)	...	...	...	...		73,088
Kahn Test (Qualitative)	...	...	...	...		13,543
Kahn Test (Quantitative)	...	...	...	...		64
Wassermann Reaction	...	...	...	...		4,194
Gonococcus Complement Fixation Test	...	...	...	...		779
Rheumatoid Factor (Rose-Waaler Test)	...	...	...	...		125
Total					...	91,793
<i>Cerebrospinal Fluid (C.S.F.)</i>						
V.D.R.L. Test (Qualitative)	...	...	...	...		1,947
Kahn Test (Qualitative)	...	...	...	...		1,537
Wassermann Reaction	...	...	...	...		21
Lange's Colloidal Gold Curve	...	...	...	...		280
Total					...	3,785
Total number of tests performed on Blood and C.S.F.					=	95,578
Blood	...	...	...	...	91,793	
Cerebrospinal Fluid	...	...	...	...	3,785	
<i>Blood</i>						
Total number of V.D.R.L. Test	...	...	...	...		73,088
number of Positive	=		1,119			
number of Doubtful	=		2,960			
number of Negative	=		69,009			
Total number of Kahn Test (Qualitative)	...	...	...	...		13,543
number of Positive	=		1,088			
Number of Doubtful	=		2,338			
Number of Negative	=		10,117			
Total number of Kahn Test (Quantitative)	...	...	...	...		64
Total number of Wassermann Reaction	...	...	...	...		4,194
number of Positive	=		845			
number of Doubtful	=		839			
number of Negative	=		2,492			
Anti-complementary	=		18			
Total number of Gonococcus Complement Fixation Test	...			...		779
Number of Positive	=		57			
Number of Doubtful	=		99			
Number of Negative	=		615			
Anti-complementary	=		8			
Total number of Rose-Waaler Test for Rheumatoid Factor	...			...		125
Total					...	91,793

*Cerebrospinal Fluid (C.S.F.)*

Total number of V.D.R.L. Test	...	...	...	1,947
Number of Positive	=	91		
Number of Doubtful	=	8		
Number of Negative	=	1,848		
Total Number of Kahn Test	...	...	...	1,537
Number of Positive	=	63		
Number of Doubtful	=	8		
Number of Negative	=	1,466		
Total number of Wassermann Reaction	...	...	...	21
Number of Positive	=	3		
Number of Doubtful	=	3		
Number of Negative	=	14		
Anti-complementary	=	1		
Total number of lange's Colloidal Gold Curve		...	...	280
Total				3,785
Total number of Paying cases from Private Clinics, and Hospitals, etc.				40



## 31. SINGAPORE HOSPITAL RESERVE

### ADMINISTRATION

THIS Unit comes under the jurisdiction of the Principal Matron, Ministry of Health. A training officer is in charge of the unit and is assisted by a clerical staff.

#### *Singapore Health Reserve Strength*

The strength of the Reserve Force stood at 714 in the beginning of 1964. The number now stands at 631. Below is the breakdown figures:

(i) Enrolments	...	57
(ii) Disenrolments	...	84
(iii) Written-off	...	56

Many of them resigned from the Corps as they have found employment and were thus unable to attend to its training. Others resigned as they wished to devote full-time to their domestic duties.

The fifty-six nursing auxiliaries who were written-off consisted mainly of the old members — some of them had been in the Corps for over a period of ten years — who had become inactive or disinterested in its activities.

#### *Trained Reservists*

Twenty-seven nursing auxiliaries have qualified as trained reservists for the year. The total number of trained reservists now stand at 458. The remaining 173 nursing auxiliaries are still under the different stages of training viz:

- (1) To attend a ten-period First Phase Training.
- (2) Attend eighty hours at the General Hospital.
- (3) To attend a ten-period Class I.
- (4) Attend twenty hours at the General Hospital.
- (5) To attend a ten-period Class II.

#### *Classes and Examinations*

Classes were conducted by the Singapore Hospital Reserve Instructors in English and Mandarin, viz:

- (a) First Phase Training.
- (b) Class I.
- (c) Class II.
- (d) Refresher Course for Instructors.

The above classes were held at the Singapore Hospital Reserve classroom. Examinations were held on completion of the classes except courses for (a) and (d) of above.

The refresher course was conducted by the training officer.

Sisters and staff nurses from the General Hospital conducted the Class I (English) and Class II (English); and Class I (Mandarin) and Class II (English) Examinations in August and November respectively.

Altogether, seven classes were conducted in the Singapore Hospital Reserve premises for the whole year.

### *Emergency Duty*

The State is fortunate to be free from any outbreak of any disease for the year. It was unfortunate, however, to have had two civil disturbances. Since there was no directive — as the Health Ministry had the pressure well in hand — for the Singapore Hospital Reserve to render assistance, its nursing auxiliaries were not called up.

### *Annual Picnic*

The annual picnic scheduled for September, was inevitably cancelled.

## 32. DEPARTMENT OF CHEMISTRY AND INSPECTORATE OF DANGEROUS AND HAZARDOUS MATERIALS

### GENERAL

#### *Development*

As mentioned in last year's report, steps were taken to erect a new apparatus store and to convert the existing apparatus store into a laboratory. These two development projects were completed at the end of July this year. The conversion involved only removal of existing work benches, fume chamber from the laboratory of the former City Analyst's Department and installation of these benches, fume chamber, electrical, gas and water fittings in the old apparatus store. With this conversion, the congestion in the Food and Drugs Section was relieved by shifting the Drugs Section into the new laboratory.

At the end of August, the painting of the whole building of the Department of Chemistry was completed. In October, the Public Works Department carried out the rewiring of the building. The left portion of the Department of Chemistry's compound had no perimeter fence, thus leaving the whole of the compound accessible to trespassers. In September, a perimeter chain-link fence and an entrance gate were erected for security reason.

#### *Paint Committee*

Mention was made in last year's annual report of the *ad hoc* Committee for the purpose of determining what unmixed raw materials used in the manufacture of paints should qualify for exemption of duties. The recommendation that this *ad hoc* Committee be a Standing Committee to hold meetings when required to consider problematical borderline cases in order to assist the Customs and Excise Department was accepted by the Permanent Secretary (Treasury). This Standing Committee comprised the Chief Chemist as Chairman, one representative from paint manufacturers, one from painter importers, one from the Economic Development Board and one from the Customs and Excise Department. One meeting in 1963 and four meetings in 1964 were held.

#### *Training*

Under the Colombo Plan Technical Co-operation Scheme offers by the State of Singapore, the Department of Chemistry gave training in the analysis of water and sewage for a period of three months to two trainees from Thailand, Miss Sunee Mayura and Miss Pradit Valyasevi and to two trainees from Laos, Messrs. Chansom Manivong and Khamsing.

In September, a newly appointed Laboratory Technician of the Primary Production Department, Mr. Choo Boon Seng was attached to the Department



of Chemistry for a period of three months to gain practical experience in the analysis of food and drugs. After completion of his training, he reported for duty at the Primary Production Department.

Through the co-operation and courtesy of the Police Force, the Deputy Chief Chemist, Mr. Chia Hong Hoe, and three Chemists, Messrs. Theng Chye Yam, Lim Han Yong and Chua Teck Hock attended a Weapon Familiarisation Course at the Advance Training School in October. The weapons dealt with were sterling gun, 0.38 revolver, shot gun, riot gun, 0.303 rifle and smoke grenades.

### *Staffing*

The staffing position at the end of the year is shown in Table 157. In April, the Deputy Chief Chemist and Deputy Chief Inspector of Dangerous Materials, Mr. Chia Hong Hoe, returned after six months training in France. His training in Paris included periods with the Laboratoire de Police Scientifique de l'Identite' Judiciaire, the Laboratoire Municipal de la Prefecture de Police, the Laboratoire de Toxicologie and the Laboratoire National de Controle des Medicaments. During his absence, the Senior Chemist, Mr. Lim Chin Hua acted as Deputy Chief Chemist and Mr. Phang Sing Eng acted as Senior Chemist.

With the appointment in June of two Chemists, Mr. Ng Seng Choew, B.Sc. (Hons.) and Mr. Chia Hong Kuan, B.Sc. (Hons.), all the eleven established posts of chemists were filled.

In January, the one vacant post of Assistant Inspector of Dangerous Materials arising from resignation last year was filled by Mr. Lee Yang Hern, B.Sc. In April, Mr. Ch'ng Beng Han, Assistant Inspector of Dangerous Materials, who has acted as Document Examiner for slightly over three years, was appointed as Document Examiner. The vacancy arising was filled in August by the appointment of Mr. P. C. Narendran, B.Sc. However, in December, Mr. Aw Soon Cheong, Assistant Inspector of Dangerous Materials resigned.

At the beginning of the year, the two Special Grade Laboratory Assistants, Messrs. Pwee Sye Cheow and Chow Weng Sing, were promoted to Senior Laboratory Technicians. In March, Mr. Ong Beng Guan, Senior Laboratory Assistant (City Analyst's Department) retired after approximately 36 years of service. During the year, with the recruitment of five Laboratory Technicians with Higher School Certificate qualification, all the post of Laboratory Technicians were filled.

Excepting for one vacant post of Assistant Inspector of Dangerous Materials, which has not been filled, the total strength of the technical staff is now 36 which include 17 degree-holders.

### *Visits*

In February, this Department was honoured by the visit of the Minister for Health, Mr. Yong Nyuk Lin, who was conducted round the laboratories and given an insight of the types of work carried out.

During the year, groups of students from Crescent Girls' School, Nanyang University, Beatty Secondary School, Anglo-Chinese School and Montfort School visited the Department of Chemistry. On seven occasions, police officers from the Advanced Training School visited the Department and were given an insight of the work carried out in the Forensic Laboratory. Among these visitors were 12 Senior Laotin Officers. On four occasions, Colombo trainees attached to the Singapore Customs and Excise Department visited the Department and were given an insight of the work carried out in the Customs Laboratory. They comprised Customs Officers from Laos, South Korea, Aden, Ceylon and Thailand. The Department was also visited by the City Health Officer, Penang, the Principal Medical Officer of Sabah, the Deputy Commissioner and Director of Provincial Hygiene, Taiwan and Professor Ralph Turner of Michigan State University, a world-renowned forensic scientist.

*Lectures*

Lectures on forensic science as an aid to police investigations were given to detectives of the Advance Training School on three occasions by the Senior Chemist, Mr. Lim Chin Hua, and the chemist in charge of Forensic Laboratory, Mr. Phang Sing Eng.

Lectures on a number of topics were also given by the Chief Chemist, Deputy Chief Chemist and chemists to students of the upper forms of secondary schools. These lectures were arranged by the Ministry of Education with co-operation of the Malaysia Branch of the Royal Institute of Chemistry.

*Work of the Department*

There were 35 attendances in Courts by chemists or document examiner to give expert evidence as compared with 54 attendances in 1963. Approximately 14 per cent of these court appearances were in connection with opium cases and 23 per cent in connection with document cases.

In connection with document examination 419 photographs were made to clarify certain reports.

This year the number of samples analysed and/or examined was 44,484 compared with 46,248 for 1963. The number of samples from the various sources of origin for the two years were as follows:

		1963	1964
Customs and Excise Department	...	7,531	7,637
Medical Department	...	4,378	3,734
Police Force	...	3,783	2,764
Water Department, Public Utilities Board	...	19,340	19,358
Public Works Department	...	3,470	3,168
Parks and Recreation Division	...	4,136	3,953
Other Government Departments	...	1,111	1,208
Commercial firms, Statutory Boards, etc.	...	2,499	2,662
	Total ...	46,248	44,484



The main contributing factors for the decrease in samples were the samples from the Police Force and the Medical Department.

The total samples analysed and/or examined by the combined City Analyst's Department and the Department of Chemistry this year as compared with those for the past five years is shown on the chart on page 320. A summary of the work of the various sections is shown in Table 158.

Publications of research work in scientific journals were "The Detection of Orange RN and Orange II in Meat" by Mr. M. C. Dutt (The Analyst, February 1964, Vol. 89, No. 1055, pp. 142-144), and "Spectrophotometric Determination of Isoniazid in Excess p-Aminosalicylate" by Messrs. M. C. Dutt and Chua Teck Hock (J. Pharm. Pharmacol., 1964, Vol. 16, pp. 696-699).

*Finance*

Under Special Expenditure, three refrigerators with a total storage capacity of approximately 30 cubic feet were bought as a replacement for one condemned 18 cubic feet refrigerator used for storing toxicological and clinical specimens. This much needed extra storage space has since proved of value. A centrifuge was also bought as a replacement for a condemned one left behind by the Japanese.

This year the amount of fees collected was approximately \$192,981 as compared with \$194,940 collected for last year. Details are shown below:

	1963	1964
Work done for the Public Utilities Board ...	72,381 50	73,048 00
Flash Point Tests ...	11,650 00	15,220 00
Methylation ...	551 00	526 00
Ship Inspection ...	94,602 50	89,370 00
Miscellaneous ...	5,750 00	14,817 00
Total ...	194,935 00	192,981 00

The co-operation of the staff and the assistance given by the Deputy Chief Chemist, Document Examiner and those Chemists to the Chief Chemist in making his annual report are gratefully acknowledged.

FORENSIC SECTION

There was a decrease this year, in both the number of exhibits examined and cases. The number of exhibits fell from 4,163 in 1963 to 3,065 in 1964, and the number of cases decreased from 703 in 1963 to 660 in 1964.

There was a mark decrease in the number of documents and opium exhibits. The number of documents examined was 1,108 this year as compared with 1,945 in 1963, and the number of opium exhibits decreased from 631 in 1963 to 365 this year. Apart from documents and opium exhibits, there was also a decrease in other types of exhibits such as vehicles, drugs, adulterated and illicit liquors and miscellaneous exhibits. There were small



increases in exhibits under the headings of arson, blood and semen, and firearms.

The monthly Police Criminal Investigation Department conference was attended by the Senior Chemist until the month of May 1964. From June until the end of the year, the Deputy Chief Chemist attended the conference. The purpose of attending such conferences was to establish a closer liaison between the two departments.

This year, officers from this department, at the request of the Police, visited scenes of crimes on twenty occasions both during and outside office hours. The increase in the visits to scenes of crimes was due to the numerous explosions by saboteurs.

### *Arson*

Exhibits from arson cases, including attempted or suspected arson, showed a slight increase in number. A total of 52 exhibits from 29 cases were examined. The exhibits examined included pieces of partially burnt rags, charred attap, tins containing liquid, partially burnt wood, gunny sacks, rolls of cotton wool soaked in petrol, sponged rubber soaked in kerosene and match sticks.

Of the total number of cases investigated, over one-third were proved to be arson by the isolation of inflammable volatile mineral oil such as kerosene or petrol from the exhibits submitted.

At the request of the Police, nine visits were made to the scenes of fires.

Two cases of fire, occurring within 24 hours inside the Port of Singapore Authority premises, were investigated.

In the first fire, two railway wagons loaded with rubber were affected. In one wagon, there were two separate and independent seats of fire and in the other wagon, two burnt match sticks were discovered on the bale of partially burnt rubber.

The second fire occurred early the next morning. This time, one bale of partially burnt rubber from a railway wagon was affected. Three partially burnt match sticks were found adhering to this bale, while four partially burnt match sticks were found beneath the bale. Thus, in the above cases, arson was proved, and these discoveries appeared to put a stop to further incidence in the Port of Singapore Authority premises.

Another case of arson leading to an arrest of an accused person occurred in Woodlands. The roof of an attap hut was found to be partially burnt, and a broken piece of cardboard was found near the burnt area. This piece of cardboard was found to fit another piece of cardboard found in the room of the suspect, thus connecting him with the crime.

One case of fire occurred in Woodlands Road involving an air filter. This air filter consisting of a metal cylinder packed with activated carbon and coconut husks was always kept bolted. An examination of this cylinder revealed three separate charred areas on the outside surface of the air filter. The three independent seats of fire strongly indicated arson.

*Blood and Semen Stains*

The number of cases and exhibits under this heading showed an increase (717 exhibits as compared with 618 exhibits for 1963).

Of the total of 717 exhibits, 624 were for the examination of blood, and of these 112 were found to give negative results. Two hundred and ninety-six exhibits gave a positive precipitin reaction for human blood, and of these, more than two-thirds were grouped as well.

Of the total number of exhibits examined for blood, 15 were from the Naval Base Police, 24 from the Sarawak Police and 22 from the Brunei Police.

Among the unusual cases was one involving the examination of bloodstains in a house at Coronation Road West. The occupants of the house saw some dark red spots on the verandah of the house and they were afraid that a burglar might have been lurking around the house and cut himself. The dark red stains were taken back to the laboratory for examination and found to be blood. But no positive precipitin reaction for human blood could be obtained. When the bloodstain was tried out with anti-sera of the various common animals, a positive precipitin reaction was obtained with anti-dog serum, thus confirming that the bloodstains belonged to a dog and not a human being.

Of the 93 exhibits investigated for seminal stains, 37 per cent of them were successfully confirmed to be stained with semen by the microscopic identification of the spermatozoa. This percentage of positive results was much higher than that of the previous year (19 per cent).

*Chandu and Opium*

The number of these exhibits decreased considerably, being about half the number for last year (365 exhibits in 1964 as compared with 618 exhibits in 1963). The decrease in exhibits was from Police source.

As in previous years, most of the exhibits were submitted either by the Singapore Police or the Customs and Excise Department. They ranged from small two-hoon packets to large consignments of smuggled raw opium. The large quantities of raw opium were usually submitted by the Customs, and in such exhibits, the morphine and moisture contents were also determined for assessing their value as a pharmaceutical commodity. Forty-five such determination were carried out.

Less than one per cent of the total number of exhibits were found to be not chandu or opium as originally suspected.

*Drugs*

The number of exhibits under this heading showed a decrease when compared with that for the previous year.

The exhibits usually consisted of indian hemp, morphine, or patented medicines examined to see whether they contained any listed poisons or dangerous drugs.



There were 11 exhibits of vegetable matter submitted by the Police and the Customs and Excise Department. These exhibits were found to be Indian hemp.

A total of 23 exhibits were examined for the presence of morphine. These exhibits were in the form of small packets of white powder, hypodermic syringe and needles, small pieces of sponge and earthenware spoons. In 22 exhibits, morphine was detected. But in one exhibit, the white powder was found to be heroin. The drug, heroin, is not commonly encountered in Singapore.

One sample of dog and cat repellent was analysed and found to contain pyridine and isopropyl alcohol.

One exhibit used as an agricultural antiseptic was found to contain dipterex.

There was one sample of powder submitted by the Health Division for the presence of organo-phosphorus compound. This powder had been used as a sticking agent for the manufacture of mosquito spirals and joss sticks. On analysis, no organo-phosphorus compound was detected in this powder.

Other poisons encountered were acetanilide, adrenaline, amphetamine, bromvaletone, chlorpheniramine, chlortetracycline, codeine phosphate, cyclizine, ephedrine hydrochloride, meclozine hydrochloride, methyl-amphetamine, penicillin, potassium cyanide, sulphanilamide, sulphapyridine and sulphathiazole.

### *Firearms*

The number of exhibits and cases under this heading showed an increase over that for last year.

A number of these exhibits were weapons for evidence of recent firing. One automatic pistol was examined for erasure of serial numbers.

However, the majority of firearm cases involved the more specialised microscopic matching of the characteristic fine lines markings on bullets and cartridge cases to determine the particular firearms used to fire them. Sometimes the range of firing was also determined from a comparison of the powder pattern around the bullet holes of the clothings.

Five samples of skins taken from around the bullet holes of the dead persons were submitted by the Pathologist for the detection of explosives powder.

An unusual firearm case involved a 0.22 automatic pistol. This automatic pistol was recovered by the Police in the course of their investigation. It was believed that this pistol was involved in four shooting incidents in Singapore. The Police also submitted four cartridge cases recovered from the scenes of the shooting incidents to ascertain whether or not they were connected with the automatic pistol. Unfortunately the automatic pistol has a broken firing pin and failed to fire test bullets. Hence, it was not possible to connect the the automatic pistol with the cartridge cases found at the scenes of the crimes.



However from a comparison of the markings on the four recovered cartridge cases, it was established that all of them had been fired from one and the same weapon.

### *Gold*

Only one case involving gold was submitted by the Customs and Excise Department. The exhibits consisted of three packages of grains of gold and two packages of grains of silver. Representative samples were taken from the packages and the gold was found to be of 99.9 per cent purity and the silver 99.8 per cent purity.

### *Liquors*

There were a slight decrease in the number of illicit liquors this year when compared with that of last year. The majority of the illicit liquor exhibits was submitted by the Customs and Excise Department. As usual, they consisted of final distilled rice spirit and the fermented rice mashes. As all these exhibits were found to have alcoholic contents of more than two per cent proof spirit, they were all certified as "intoxicating liquor" as defined in the Customs Ordinance.

One case involving eight bottles of beer of a well-known brand was from the Naval Police Force. On analysis, the contents of five of the bottles were found to be adulterated.

Another case involved a shop which was not licensed to sell liquor. The Police raided this shop and seized three bottles for analysis of alcoholic contents. Although alcohol was detected in the contents of the three bottles, the amount of liquid in two bottles were insufficient for quantitative estimation of alcohol. However the spirit strength of the content of one bottle was found to be over two per cent proof spirit and was thus certified as "intoxicating liquor" as defined in the Customs Ordinance.

### *Tobacco*

The number of tobacco exhibits was about the same as that for last year. The exhibits consisted of packets of smuggled cigarettes and tobacco and have to be examined for the benefit of the courts.

### *Vehicles*

The number of vehicle cases showed a slight decrease. Out of a total of 47 exhibits submitted, 13 were from the Registrar of Vehicles, and the remainder were from the Police. More than half of the total exhibits were submitted for the restoration of erased engine and/or chassis numbers. Of these, in about 85 per cent of the exhibits, the erased numbers were either fully or partially developed.

There were four cases in which acids were thrown on the vehicles. The acids encountered were nitric acid, hydrochloric acid and sulphuric acid. In three cases organic type of paint removers were thrown on cars. This type of paint remover usually consisted of a mixture of organic solvents and a small amount of wax which prevented the escape of volatile solvents, thus making it more effective.

There were also two cases in which the vehicles were submitted for the examination of the various paint layers in order to determine the original colours of the vehicles.

In "hit and run" cases involving a vehicle and a person, the vehicle was examined for presence of bloodstains, hairs and torn pieces of clothings. If two vehicles were involved, besides the above, the examination of paints and broken pieces of headlamp glass can also yield useful evidence in solving the case.

In one accident case involving "hit-and-run", fragments of broken glass found at the scene of the accident and a suspect car were submitted. On examination, one of the pieces of glass found at the scene was found to fit the piece of glass still adhering to the parking lamp of the car, thus connecting the car with the scene of the accident. See Plate I.

### *Miscellaneous*

Although the number of exhibits under this heading showed a slight decrease, there was an actual increase in the number of cases (98 cases this year as compared with 67 cases in 1963).

There were the non-routine type of exhibits covering a wide variety of crimes and required special examination.

Of the total of 98 cases, more than ten per cent involved acid throwing. The most common acid used was sulphuric acid. Other acids used were nitric acid, hydrochloric acid and formic acid. In acid throwing cases, not only the contents of the containers or electric bulbs filled with acid were analysed, but also the clothings of the victims were examined for the presence of acids.

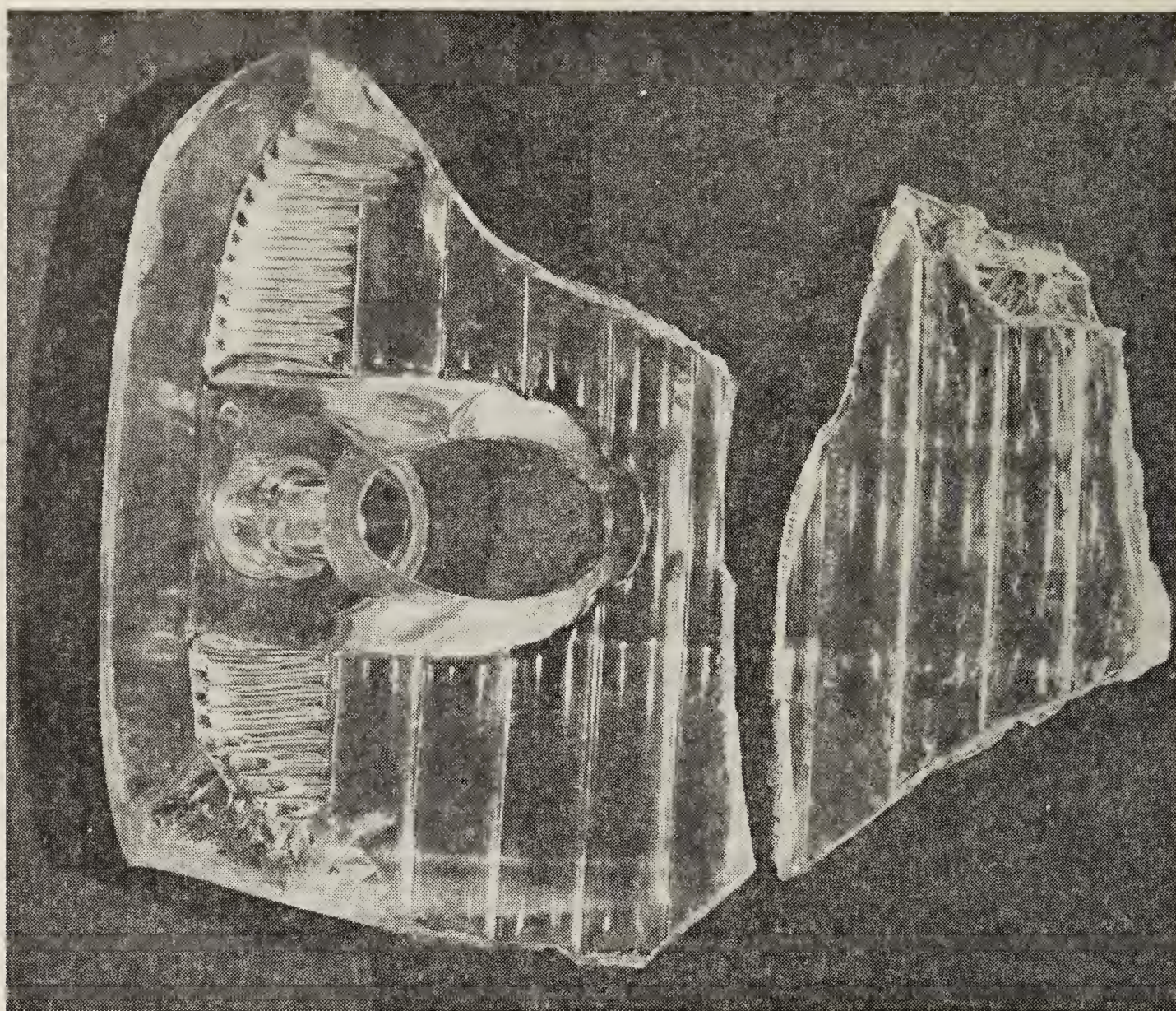
There was also one case in which two persons had an argument. One of them took a tin containing some liquid and threw it on the face of the other person. On analysis, the liquid was found to contain sodium hydroxide. The throwing of acids or sodium hydroxide is an offence under the Corrosive Substances Ordinance, 1955.

Another case involved the throwing of a brown liquid on a person. This liquid was found to contain cresol which came under the class of phenols listed in the Schedule to the Corrosive Substances Ordinance, 1955.

One case involving pepper throwing in an unsuccessful "hit-and-run" wage robbery was investigated. The clothings of the victim was found to be stained with pepper.

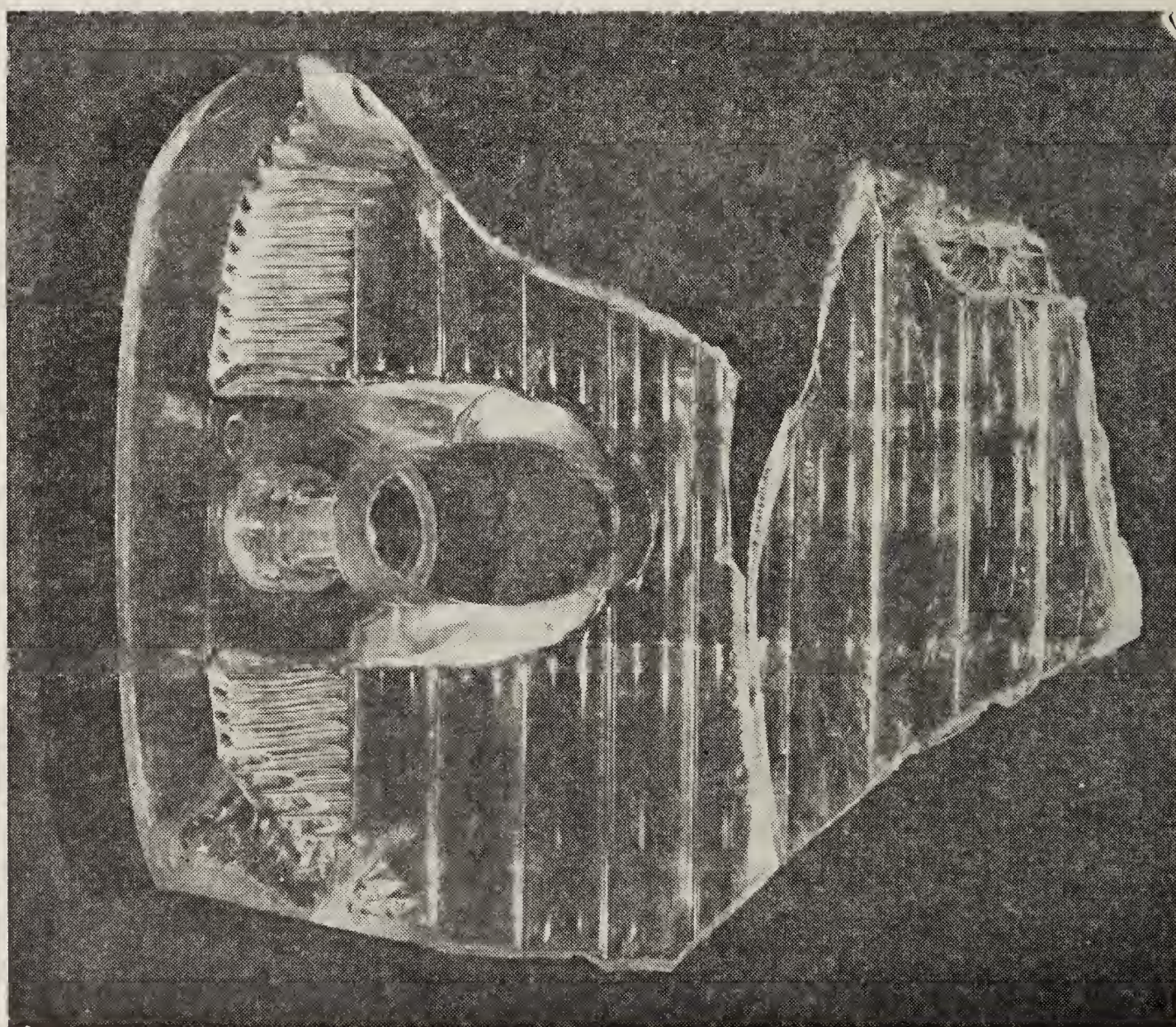


PLATE I



from car

from scene





There was one case of counterfeiting “50 cents” coins. Information was received by the Police that a certain shopkeeper was making use of “50 cents” counterfeit coins when returning the change to customers. These counterfeit coins were submitted together with 10 genuine “50 cents” coins obtained from the Treasury. From a comparison of the physical properties, without destroying the coins, the counterfeit coins were found to be different from the genuine coins in respect of specific gravity, thickness and the weight.

Cases involving fraud were also encountered. There were two cases in which the contents of a popular brand of insecticide were analysed and found to be different from the contents of the genuine samples.

There was also one case involving a well-known brand of shampoo, the contents of which were different from that of the genuine samples.

In connection with five cases of imitation shirts of a well-known brand, the labels on the suspect shirts were found to be different from the labels on the genuine shirts. In some of the above cases, the material of the suspect shirts was found to be different from that of the genuine shirts.

In one case, the police made a surprise check of a premises after midnight and found customers consuming liquors. Two glasses containing liquid were seized. The liquid was found to be “intoxicating liquor” as defined in the Customs Ordinance.

There was one case concerning the theft of two bunches of bananas. At about midnight, the complainant found an Indian with two freshly cut bunches of bananas on the carrier of his bicycle. The complainant also found that the stems of two of the banana trees in his compound had been cut. The Indian was charged in court for the theft of the bunches of bananas, but he denied the charge. On examination, the ends of the stems of the two bunches of bananas were found to fit the ends of the cut stems of the two banana trees, thus proving that the two bunches of bananas came from the two trees. Photographs were taken in this case for production in court. See Plate II.

An unusual case from Brunei concerned a “hit-and-run” accident between a vehicle and a cyclist. The cyclist was carrying a kettle when he was knocked down by the vehicle. The kettle was dented and both the kettle and the vehicle number plate of the vehicle were submitted for examination. On the dented portion of the kettle there was an impression of a mirror image of the figure “2” and an outline of the vehicle number plate. A reversed photograph of the impression on the kettle was taken, and comparison with the vehicle number plate revealed that the vehicle number plate caused the impression on the kettle, thus connecting the vehicle with accident. See Plate III.

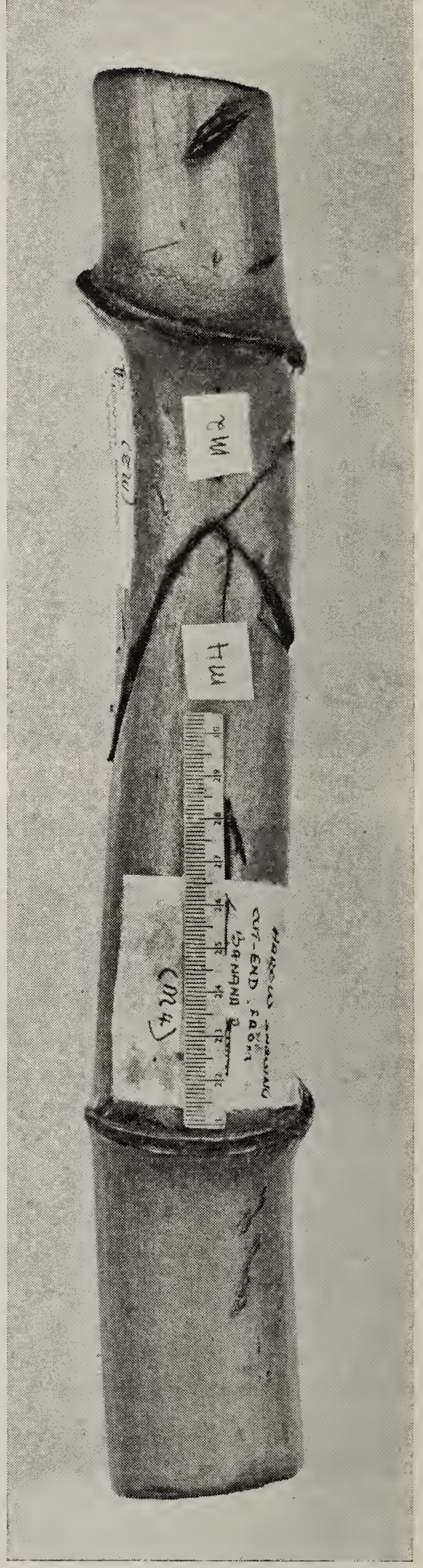
From the Customs and Excise Department, there were three cases involving importation of sodium glutamate without licence and six cases involving possession of uncustomed goods and evasion of petroleum duties. Duty free petrol for the army authorities is coloured blue.



# PLATE II



from banana tree



from bunch of banana



PLATE III



Dent and impression on kettle



Vehicle number plate



In the exhibits submitted this blue dye was detected.

There were several cases involving the examination of exhibits for explosives. Two of these cases were from the Sarawak Police.

The first case consisted of a piece of brown material which was found in a booby trap. This brown material was found to be T.N.T.

In the second case, greyish flakes were found wedged inside a section of a bamboo. On analysis these greyish flakes were found to be of the nitrocellulose type of explosives.

In Singapore, a Customs' party raided a house for narcotics. Besides finding opium, they also found tins of brownish powder, drums of white powder and sticks of gelatinous material. Analysis revealed that the brownish powder was T.N.T., the white powder potassium chlorate and the sticks of gelatinous material nitroglycerine explosives.

A Police party raided a store and recovered three tins of brownish powder, which on analysis was found to be T.N.T. This store was being used by fishermen to keep their fishing equipment. It was believed that the T.N.T. was used for fishing by the fishermen.

In another case, the Police recovered large quantities of explosives which included rectangular slabs of T.N.T., each block weighing either half a pound or one pound. These slabs have ready-made holes in the centre for the insertion of detonators and fuse, and presumably were for use by saboteurs.

Because of the number of explosions by saboteurs, visits to scenes were made and analysis carried out on materials collected at the scenes of explosions. No less than ten visits, usually outside office hours, were made to the scenes of explosions.

In one case, at about 10 p.m., at the request of the Police, the Chemist in charge of Forensic Laboratory proceeded to the scene of explosion at Merdeka Bridge. The crater caused by the explosion was approximately 12 inches in diameter and 6 inches deep, but the atmosphere around this crater had an almond like odour consistent with nitroglycerine type of explosives having been used. Small pieces of metal and earth around the crater were collected for subsequent analysis in the laboratory. Nitroglycerine type of explosives such as gelignite and blasting gelatine was detected on these exhibits.

In another explosion at night the Deputy Chief Chemist proceeded to the scene. This time, the piece of wire, metal and broken pieces of concrete near the seat of explosion were found to give a colour test consistent with T.N.T.

In those cases where no visits were made to the scenes of explosions, the Police collected the exhibits at the scenes of explosions and submitted them for analysis. A detailed analysis was always carried out on each of the exhibits for explosives such as T.N.T., nitroglycerine, picric acid, chlorate and perchlorate. The analysis for the products of explosion such as nitrite, nitrate, chloride and sulphate was also carried out.

In one case, a bomb exploded on the staircase of a block of flats. Among the exhibits submitted by the Police were small pieces of metal on which were detected nitrite, nitrate and residual T.N.T.

An unusual exhibit received was a home made grenade found in the jacket of a person. This grenade consisted of a length of metal pipe packed with gun powder. Strands of paper, tied together in a bunch, protruded from the centre of this metal pipe to serve as a fuse.

### *Documents*

The Document Examiner was on duty this year attending to a total of 102 cases involving 1,108 documents. Of these, about 44 per cent involved examination of handwriting in English, 24 per cent in Chinese and six per cent in Rumi Malay. The remainder were cases involving fraudulent erasures and alterations, forgeries of documents such as admission tickets, and identification of typewriters.

A case in which documents submitted by the Police proved of value was in connection with an anonymous letter claiming that a bomb had been planted at a certain locality. The Police were alerted but it was found to have been a hoax. Investigations led to a suspect in whose room was found a writing pad which showed indented writing impressions. Oblique light photography produced a readable copy of the indentations which, when compared, was proved to match the anonymous in details. Further comparison between the specimen handwriting of the suspect and the anonymous handwriting on the letter showed similar writing characteristics pointing to common authorship. The suspect pleaded guilty. See Plate IV.

In January, the Document Examiner was requested by the Sarawak Police to make an urgent trip to Kuching in order to give expert evidence in court in a trial in which, for technical reasons, his written report was not admissible as evidence in court. The handwriting evidence identifying the accused as the probable writer of a series of extortion letters involved in the case formed a very important part of the evidence by the prosecution leading to the conviction of the accused.

In a case of cheating by a person purported to be a Royal Air Force personnel, who disappeared after buying a tape recorder on a hire-purchase basis, investigations pointed to a possible suspect. His specimen handwriting was submitted to the Document Examiner for comparison with the writing on the hire-purchase agreement. The evidence gathered by the Document Examiner showed that the suspect was not the person who wrote the questioned writing on the agreement.

Besides the Singapore Police, the Document Examiner also rendered his services to the Royal Malaysian Navy, Royal Air Force, Naval Base Police, Sarawak Police and various Departments of the Singapore Government, namely, Income Tax Department, Customs, Corruption Practices Investigations Bureau and the General Hospital.



A. U. A. DeFe-  
Leach's Training College,  
Patterson Road.  
27. 1. 64.

To Kandang Kerbau Police Station,  
Singapore

Dear Sir,

It has come to my notice that  
there is a bomb planted in the pre-  
mises of Dah Hin Optical House, in North  
Bridge Road, next to Oleon. Please take  
action before the bomb explodes.

Yours truly  
P. S. S. S.

## The 'hoax' letter

## The indented impressions by oblique light photography



## FORENSIC SECTION

## DISTRIBUTION OF WORK 1964

Class of Work	SOURCE						
	Customs	Medical	Police	Other Depart- ments	Non- Official	Total Samples	Total Cases
Arson .. ..	..	..	50	2	..	52	29
Blood and Semen ..	..	2	641	15	59	717	189
Chandu and Opium ..	86	..	278	..	1	365	105
Documents ..	2	3	947	60	96	1,108	102
Drugs .. ..	13	5	157	..	1	176	46
Firearms Cases ..	..	5	159	4	..	168	24
Gold .. ..	3	..	..	..	..	3	1
Liquors:							
Adulterated ..	..	..	..	8	..	8	1
Illicit ..	106	..	3	..	..	109	22
Tobacco .. ..	11	..	..	..	..	11	5
Vehicles .. ..	..	..	35	12	..	47	38
Miscellaneous ..	54	..	235	..	12	301	98
Total ..	275	15	2,505	101	169	3,065	660

## HEALTH SECTION

*Food and Drugs Ordinance*

The Environmental Health Section, Public Health Division of the Ministry of Health, submitted a total of 1,422 samples mainly in connection with the enforcement of the Food and Drugs Ordinance. The number of samples was somewhat lower than that of 1962 namely 1,624. Of the total number of food and drugs samples, 87.3 per cent consisted of foodstuffs, 11.1 per cent medicine and drugs and 1.6 per cent cosmetics, etc.

*Foodstuffs*

The total number of formal food samples was 809 as compared with 1,036 for 1963 and the total number of informal food samples was 432 as compared with 353 for 1963. Though the figure for the formal samples is



lower than the 1963 figure, it was about 64 per cent higher than the 1962 figure of 496. Increase in buttermilk and apples which were sampled informally, contributed substantially to the increase of informal samples this year.

Of the 809 formal food samples examined, approximately 29 per cent were found to be either adulterated, below standard or otherwise defective and appropriate certificates were issued (vide Table 152, for details including those for informal samples).

A wide variety of food, such as "tow kuah", "char-siew", iced drinks, cakes and syrups were submitted for the presence of non-permitted dyes. In spite of prosecutions, the use of Metanil Yellow, a non-permitted dye, continued to be in use in "tow kuah" in preference to other permitted yellow dyes. It was, however, gratifying to note that the use of Orange II, a non-permitted dye, in "char-siew", has to a great extent been replaced by permitted dyes. Out of 50 samples, only 12 were found to contain Orange II.

Towards the end of the year, in the course of analysis of routine samples, one sample of apples was found to contain 1.5 parts per million arsenic, the permitted limit being 1.0 parts per million. In view of this, samples from all further consignments from the country of origin were first subjected to analysis and if they contained excessive arsenic advice was given to wash the apples. Samples from the washed apples were resubmitted for analysis to ensure that the arsenic content was below the permitted limit before release for sale to the public. Two samples from two consignments were also found to contain excessive arsenic — 1.3 and 1.4 parts per million respectively. The wrappers of one of these samples contained 6.1 parts per million arsenic.

During the second half of the year eight samples of margarine were found to contain excessive water, about 24 per cent, which exceeded the permitted limit of 16 per cent. It would appear that water has been added to imported genuine margarine for purposes of adulteration.

Arising from a complaint, one sample of a proprietary brand of essence of chicken was submitted for analysis and was found to contain insignificant amount of protein when compared with a genuine sample.

One sample of brandy was submitted for compliance with the Food and Drugs Regulations. This sample was found to contain dyes which were not present in genuine brandy.

Saccharin continued to be used fairly extensively in all types of foods, especially in still drinks. Its use in food without licence is prohibited under the Food and Drugs Regulations.

A few samples of brown sugar were found to contain Orange II, a non-permitted dye.

Out of about 180 samples of coffee and coffee mixtures analysed, 26 or about 15 per cent, were found to be adulterated.

Two samples of tea were found to contain dyes. The use of dyes in tea is prohibited.

One brand of syrup on analysis was found to contain no black-currant, phosphoric acid and caffeine as claimed on the label. A number of this fake

syrup has been disposed to unsuspecting customers before the person responsible was apprehended.

### *Medicine and Drugs*

A total of 158 samples were submitted for examination of which 131 samples were formal. As in previous year, these consisted of British Pharmacopoeia or British Pharmaceutical Codex preparations and patented medicines. These were examined either for conformity to British Pharmacopoeia or British Pharmaceutical Codex specifications or for checking the ingredients declared on the labels.

A number of irregularities were detected as listed in Table 153. Among these, seven samples of medicated oil were found to be either deficient in methyl salicylate or to have excessive methyl salicylate.

Of interest was one case involving a fake brand of eye lotion. Analysis and comparison with genuine sample revealed that in the spurious sample one ingredient was absent and the amounts of two ingredients were far out of the amounts present in the genuine sample.

There was one sample of tablets submitted by the Inspector of Poisons, the formulation of which was not declared. On analysis this was found to contain amphetamine which is a listed poison under the Poisons Ordinance.

### *Other Samples*

Of the 23 official samples submitted, 11 samples were formal. These official samples consisted of hair dyes, cosmetics and colouring matter. Two samples of hair dyes were found to contain 1.1 per cent and 2.1 per cent of lead respectively, an offence under the Food and Drugs Ordinance. Two samples of hair spray were found to contain approximately 30 per cent and 40 per cent of methyl alcohol respectively. However no restriction on their sale could be enforced under the Food and Drugs Ordinance.

## OTHER MEDICINES AND DRUGS

The Government Pharmaceutical Laboratory and Store submitted 831 samples for assay and/or compliance with British Pharmacopoeia specifications. Those analysed for compliance were mainly the raw materials supplied by tenderers. Those for assay were routine samples for checking as a control on their own preparations, e.g. tablets, injections, syrups, tinctures, etc. The majority of these samples were confirmed to be within specifications.

Dispensaries at the General Hospital and other hospitals also submitted for analysis samples of drugs which had been kept for sometime as a precaution against deterioration.

For the Customs and Excise Department 45 samples of raw opium were assayed for their moisture and morphine contents with a view to their ultimate sale.



*Metallic Contamination*

From the routine samples of liquor submitted by the Customs and Excise Department for spirit strength and other determinations, 104 samples were checked for lead and copper contents. Four samples submitted by commercial firms were also similarly checked. The samples which were checked included new brands of liquor and those brands previously found to contain high lead or copper.

One sample of brandy was found to contain 1.2 parts per million of lead which was in excess of the permitted limit of 0.5 parts per million. One sample of liquor was found to contain 8 parts per million of copper which was in excess of the permitted limit of 2 parts per million. Prohibition of importation of these samples were recommended.

The limits for copper and lead in liquors are laid down in the Food and Drugs Regulations and in the Customs (Prohibition of Imports) Notification 1963.

HEALTH SECTION  
DISTRIBUTION OF WORK 1964

Class of Work	SOURCE					
	Customs	Medical	Other Depart- ments	Non- Official	Total Samples	Total Cases
Food and Drugs Ordinance:						
(a) Foodstuffs:						
Formal   ..   ..   ..		809	..	..	809	809
Informal ..   ..   ..		423	..	46	479	..
(b) Medicine and Drugs:						
Formal   ..   ..   ..		131	..	..	131	131
Informal ..   ..   ..		27	..	..	27	..
(c) Other Samples   ..   ..		23	..	2	25	12
Foods:						
Other       ..   ..   ..		..	1	..	1	..
Medicine and Drugs						
Other       ..   ..   ..	45	831	1	14	891	..
Metallic Contamination ..	104	..	..	4	108	..
Total   ..	149	2,253	2	66	2,471	952

Table 152

FORMAL AND INFORMAL FOOD SAMPLES ADULTERATED  
OR OTHERWISE IRREGULAR

No	Sample	Nature of Irregularity
18	Aerated Water and still drink	Contained saccharin.
5	Aerated Water and still drink	Contained excessive permitted preservative.
1	Aerated Water and still drink	Contained saccharin and excessive permitted preservative.
2	Aerated Water and still drink	Contained non-permitted dye.
4	Cakes	Contained non-permitted dye.
12	"Char-Siew" (Roasted Sweet Meat)	Contained non-permitted dye.
1	Chilly Powder	Contained non-permitted dye.
1	Chilly Powder	Adulterated with starch.
2	Chilly Sauce	Contained saccharin.
3	Chilly Sauce	Contained saccharin and excessive permitted preservative.
26	Coffee and Coffee Mixture	Deficient in coffee.
3	Coriander Power	Adulterated with starch.
1	Essence of Chicken	Not genuine.
3	Fruit	Contained excessive arsenic.
9	Ghee	Not genuine deficient in butter fat.
17	Groundnut Oil	Not genuine groundnut oil.
3	Honey	Contained sucrose (cane sugar).
4	Iced drinks	Contained non-permitted dye.
7	Iced drinks	Contained saccharin.
1	Iced drink	Contained saccharin and non-permitted dye.
1	Iced drink	Contained saccharin and excessive permitted preservative.
8	Margarine	Contained excessive water.
6	Milk	Deficient in solids-not-fat.
1	Milk	Deficient in solids-not-fat and fat.
1	Popsicle	Contained saccharin.
7	Sauce (other)	Contained excessive permitted preservative.
1	Sauce (other)	Contained saccharin.
4	Sugar (coloured)	Contained non-permitted dye.
1	Syrup	Contained saccharin.
1	Syrup	Contained saccharin and non-permitted dye.
1	Syrup	Contained saccharin and excessive permitted preservative.
1	Syrup	Contained excessive permitted preservative.
1	Syrup	Contained non-permitted dye.
1	Syrup	Label infringed Regulation 5 (1) (d).
9	Syrup	Deficient in Vit. C/Ascorbic Acid.
66	Tow Kuah (bean cake)	Contained non-permitted dye.
2	Tea	Label infringed Regulation 5 (1) (d).
2	Tea	Contained dyes.



Table 153

DRUGS SAMPLES ADULTERATION OR OTHERWISE IRREGULAR

No.	Sample	Nature of Irregularity
3	Tincture of Iodine B.P.	Deficient in iodine.
1	Tincture of Iodine B.P.	Excessive iodine.
1	Zinc Ointment	Deficient in zinc.
1	Vitamin A capsule	Deficient in vitamin A.
1	Halibut liver oil capsule	Deficient in vitamin A.
1	Cod liver oil	Deficient in vitamin A.
1	Fever Powder	Deficient in weight.
1	Fever Powder	Excessive caffeine.
3	Medicated Oil	Deficient in methyl salicylate.
4	Medicated Oil	Excessive methyl salicylate.
1	Eye Lotion	No berberine.
		Deficient in boric acid.
		Excessive zinc sulphate.

18

Total number of formal samples received	...	...	...	131
Number of unsatisfactory samples for which Certificates were issued	...	...	...	18
Percentage of unsatisfactory samples	...	...	...	13.8%

WATER AND SEWAGE SECTION

Water

The total number of samples received and analysed during the year amounted to 23,608. Of these 18,901 samples (approximately 80 per cent) were submitted by the Water Department of the Public Utilities Board and 3,953 samples of swimming pool water (approximately 16.7 per cent) by the Parks and Recreation Division of the Ministry of Labour. The remaining 3.3 per cent of water samples received from various sources were of diversity in nature.

Drinking Water

The samples from the Water Department of the Public Utilities Board were for routine examination and for special investigation purposes.

The daily routine tests were essential for the determination of the efficiency of purification process at the various treatment works and for ensuring that there was no deterioration of the treated water in the distribution system. The table below shows the various samples received from the Water Department:

Routine daily water samples	
From treatment works and distribution system	12,132
From Camp supplies	1,443
For Fluorine Test	5,151
Monthly samples from Clear Water Tank	67
Quarterly samples of raw water	36
Water for Special Investigations	72
	18,901

In the second half of the year, the sources of water supply of Singapore was augmented by the completion of the Scudai Water Works. The treatment employed at this new works was similar to that used at Tebrau Water Works, namely employing activated silica in conjunction with small doses of lime and alum. In spite of the new source of water supply, the total number of samples of drinking water submitted was about the same as that for last year (18,901 as compared with 18,853). Since July, samples of raw water from the reservoirs or rivers were submitted quarterly instead of monthly as was with previous practices. Tables 154 and 155 show the average figures of quarterly tests on raw water and the monthly tests on treated water.

The Singapore water continued to received fluoridation throughout the year to the extent of about 0.7 parts per million of fluorine. This year is the eighth year of the fluoridation of the Singapore water supply and the effect of this addition is being surveyed by the Chief Dental Officer.

Routine chemical and bacteriological tests were performed on well water from rural areas sampled by the Public Health Inspectors. The bacteriological results indicated that by the usually accepted standards, the water from these wells were unfit for human consumption. It is fortunate that the use of this type of water supply for consumption is on the wane with the ever increasing spread of stand-pipe water.

The Port of Singapore Authority continued to submit, once a month, water samples from its storage reservoir for chemical and bacteriological tests. These water samples were found to be satisfactory. A sample of drinking water from the storage tank of a Royal Malaysian vessel was examined for sea water and other contaminations.

Four samples of tap water coming from a storage tank in a private premises were submitted by the Public Health Inspector. The storage tank was said to have been recently painted with coal tar. Phenol was detected in all the four samples and advice was given not to use this water for drinking purposes. Of two samples of water from storage tanks in the Jurong area, one sample was found to be bacteriologically unsatisfactory.

Four samples of rain water collected in petrol drums were received from a hospital in Tawau. These samples were tested for content of lead and were found to comply with the British Pharmacopoeia limit test for lead in purified water.

### *Swimming Pool Water*

A total of 3,861 samples of pool water were submitted by the Parks and Recreation Division of the Ministry of Labour. Daily tests were done on the water from the following public pools:

Mount Emily Pool	...	565
Yan Kit Pool	...	1,072
River Valley Pool	...	1,136
Farrer Park Pool	...	1,088
		<hr/>
		3,861
		<hr/>

Commercial samples from four social clubs, one seamen's club, three Royal Air Forces Stations and a hotel amounted to 407 samples.



*River Water*

The river water samples amounting to 171, submitted by the Public Works Department, were taken from Singapore River, Geylang River, Kallang River, Serangoon River, Sungei Whampoa, Jurong River, Katong Canal, Siglap Canal, Stamford Canal and Rochore Canal. They were analysed with a view to determine the extent of pollution and to detect any new source of pollution as for instance the discharge of untreated trade effluents. Except for Jurong River, the others were far from satisfactory.

The 36 samples from a dam in Jurong were submitted by the Public Health Engineer for the purpose of mosquito control. They were analysed for the chloride content since anopheles mosquitoes breed on brackish water having a chloride content lying within a certain range.

*Aquarium Water*

Routine analysis were done regularly on both fresh and salt water from the Van Kleef Aquarium.

*Other Water*

All the samples were from commercial sources. The majority of the samples were for conductivity. One sample submitted by the Chief Gas Engineer was tested for chloride content in order to ascertain the extend of tidal contamination of the cooling water used at the Kallang Gas Works. This water was found to contain approximately 7 per cent of sea water.

*Sewage*

The following samples were analysed for the Public Works Department:

Sewage, sludges, top-water and effluents		
from sewage disposal works	...	1,171
Septic Tanks	...	1,767
		<hr/> 2,938

The sewage samples from sewage disposal works at Kim Chuan Road and Serangoon were regularly examined throughout the year. The average results for the effluents from Kim Chuan Road works are shown in the Table below:

AVERAGE ANALYSIS OF SEWAGE WORKS EFFLUENTS  
(in parts per million)

		Kim Chuan Road Works		
		Phase I	Phase II	Phase III
Free and Saline Ammonia	...	40.0	37.3	39.1
Albuminoid Ammonia	...	1.1	1.2	1.1
Oxygen Absorbed in 4 hours	...	26.1	21.7	21.6
Biochemical Oxygen Demand	...	87.3	38.4	34.6
Total Solids	...	593	592	614
Suspended Solids	...	49.4	50.6	54.4
Nitrates	...	absent	absent	absent
Chlorides (as Cl)	...	182	183	186
pH	...	7.1	7.2	7.2

For septic tank effluents, it was agreed with the Public Works Department that for assessing the quality of the effluents the standards of 10 parts per million for oxygen absorbed in 4 hours by potassium permanganate and 30 parts per million for suspended solids be adopted.

Of the three non-official samples, two were from the Royal Malaysian Navy at Woodlands and one from the Royal Air Force at Tengah.

## WATER AND SEWAGE SECTION

### DISTRIBUTION OF WORK 1964

Class of Work			SOURCE					Total Samples
			Medical	Water Department	Public Works Department	Parks and Recreation	Other Departments	
Water:								
Drinking	..	71	18,901	..	..	..	35	19,007
Swimming Pool	..	..	..	..	3,861	..	407	4,268
River	..	36	..	171	..	..	6	213
Sea	..	..	..	..	..	..	..	..
Aquarium	..	..	..	..	92	..	..	92
Boiler	..	..	..	..	..	..	..	..
Other	..	..	..	..	..	..	28	28
Sewage	..	..	..	2,938	..	..	3	2,941
Total	..	107	18,901	3,109	3,953	..	479	26,549

Table 154

## RAW WATER

AVERAGE RESULTS OF QUARTERLY SAMPLES, 1964  
(Results in Parts Per Million)

[illegible]



Table 155

TREATED WATER  
FROM CLEAR WATER TANK  
Average results of Monthly Samples, 1964  
(Results in parts Per Million)

	Tebrau	Gunong Pulai	Wood- leigh	Bukit Timah	Bedok	Scudai
Ammoniacal Nitrogen ..	0.32	0.25	0.21	0.14	1.36	0.01
Albuminoid Nitrogen ..	0.03	0.06	0.05	0.05	0.12	0.01
Nitrite Nitrogen .. ..	absent	absent	absent	0.01	trace	absent
Nitrate Nitrogen .. ..	0.06	0.03	0.03	0.07	0.10	0.24
Carbon Dioxide .. ..	0.1	0.1	0.2	0.2	1.8	0.3
Total Alkalinity (as CaCO3) ..	11	9.6	8	8.5	108	10
Total Hardness (as CaCO3) ..	25	24	29	31	168	27
Carbonate Hardness (as CaCO3)	11	9.6	8	8.5	108	10
Chlorides (as Cl) .. ..	4	4	3.3	4.5	74	5
Iron (as Fe) .. ..	0.1	0.1	0.1	0.1	0.1	0.15
Soluble Alum (as Al) .. ..	0.25	0.30	0.40	0.35	0.05	0.05
Total Residual Chlorine ..	1.15	1.22	0.90	0.79	1.15	0.32
Oxygen Absorbed from Perman- ganate in 4 hours .. ..	0.3	0.5	0.7	0.4	0.8	0.1
B.O.D. in 3 days .. ..	0.5	0.6	0.7	0.7	0.6	0.1
Total Solids .. ..	40	52.5	45	49	395	54
Suspended Solids .. ..	2	1.1	0.6	1.5	3.8	1
Colour (Hazen Units) .. ..	5	5	5	5	5	5
Turbidity (Silica Units) ..	0.57	0.65	0.88	0.90	1.30	1.90
pH Value .. ..	7.5	7.5	7.3	7.3	7.8	7.9

MISCELLANEOUS SECTION

General

Three hydrometers from the Customs and Excise Department and three from a commercial firm were calibrated, and a correction table was supplied for each hydrometer.

Two samples of khaki cloth from the Police were tested for fastness of colour and shrinkage. The Public Works Department submitted 36 sheets of blotting paper for impregnation with lead acetate to be used for testing of hydrogen sulphide gas, and seven samples of soil for pH and concentra- tion of sulphate.

The Chief Fire Officer submitted one sample of a blue granular material for detection of celluloid. The Primary Production Department submitted 75 samples comprising 30 samples of feedstuffs being pig or poultry rations, one sample of prawn dust, 10 samples of vegetable, one sample of mushroom grown from padi straw and 33 samples of soil for analysis mainly for the contents of nitrogen, phosphorus, potassium, moisture, calcium, magnesium, salt or organic matter and also for pH value in the case of soils. Samples of soil for analysis were also received from the Public Works Department.

*Metals, Minerals and Chemicals*

The Senior Radiologist submitted four samples of used fixer solution for their silver content to determine whether it was economically worthwhile to recover the silver from the solution.

The Water Department, Public Utilities Board, submitted for analysis 74 samples of water treatment chemicals comprising hydrated lime, aluminium sulphate, sodium bicarbonate, sodium silicofluoride, chlorinated lime and sodium aluminate for compliance with their specifications. Also submitted were seven samples of filter sand for sieve grading, and one sample of fertiliser for arsenic content to determine its suitability for use on turf in the catchment area. Request was received for the preparation of 11 samples of orthotolidine and phenol red reagents.

One sample of wire mesh netting from the Public Works Department was tested for its galvanised coating in accordance with British Standard Specifications. Twelve samples of quarry sand were tested for their salt content, and two samples of clay taken from the proposed Toa Payoh Sewerage Scheme site for sulphate content.

Several commercial firms submitted 41 samples of sodium arsenite for compliance with statutory colour requirements of the Federation Poisons (Sodium Arsenite) Ordinance, 1949, all of which were found to comply. Three cylinders of carbon dioxide were received from commercial firms for purity test. The Primary Production Department submitted one sample of fertiliser for contents of nitrogen, phosphorus and potassium.

Twenty-five samples of soap submitted by the Central Supplies Office were analysed for compliance with their specifications. In connection with preparation of reagents, four lots of solution for testing residual hypo in films were made for the Chief Surveyor, six lots of photographic developer for the General Manager's Office, Public Utilities Board, four bottles of standard alkali and two bottles of solution for testing of hardness for commercial firms.

*Microfilm*

810 samples of microfilms were tested for residual hypo for the Microfilm Unit.

*Oils*

Sixteen samples of anti-malarial oil were tested for the Public Health Division for conformity with specifications. One sample of diesel oil for salt content was carried out for the Senior Mechanical Engineer, Public Works Department.

The Broadcasting Division, Ministry of Culture, submitted 173 samples of transformer oil for acidity tests. Two samples of patchouli oil were received from a commercial firm for solubility tests in 90 per cent alcohol.



MISCELLANEOUS SECTION  
DISTRIBUTION OF WORK 1964

Class of Work	SOURCE								
	Customs	Medical	Police	Water Department	Public Works Department	Parks and Recreation	Other Departments	Non-Official	Total Samples
General .. ..	3	..	2	..	43	..	76	16	140
Metals, Minerals and Chemicals ..	..	4	..	93	15	..	36	50	198
Microfilm .. ..	..	..	..	..	..	..	810	..	810
Oil .. ..	..	16	..	..	1	..	173	2	192
Total ..	3	20	2	93	59	..	1,095	68	1,340

The Singapore Fire Brigade submitted 40 samples of liquid for classification as to whether or not they were "Petroleum" as defined in the Petroleum Ordinance or "Cellulose Solution" under the Cellulose Solution By-Laws. Eight samples were found to be not classifiable as either "Petroleum" or "Cellulose Solution".

### REVENUE SECTION

The account given here covers all the work done for the Customs and Excise Department except work in connection with offences under The Customs Ordinance or preventive aspects. Work of the latter nature is described in the Forensic Section.

As in previous years the bulk of the samples comprised liquors, the rate of duty on which depends on their alcohol contents, volumes and classification. During the year 5,003 liquor samples (excluding toddy samples) were submitted by the Customs and Excise Department for classification and determination of spirit strengths and volumes. The figure for last year was 6,928. Labels of liquor samples were also checked for compliance with the Food and Drugs Regulations. Importers were advised by letter whenever the examinations revealed any contravention of the above regulations.

Although there was a reduction in the number of liquor samples and toddy samples (305 as compared with 417 for last year), the total number of samples under the Revenue Section for this year has increased (7,457 as compared with 7,096 for last year). The increase was due to the increase of the variety of samples classed under Duty Category Investigations.

*European-Type Liquors*

The total number of the above type of liquors submitted by the Customs and Excise Department was 2,547. Five samples were received from commercial firms. Apart from the need to comply with limits for lead and copper prescribed by the Food and Drugs Regulations, whisky, rum, gin and brandy have also to conform to standards for spirit strength and also ester content in the case of brandy only.

Eight samples of brandy, six samples of rum and one sample each of whisky and gin were classified as "Intoxicating liquor not elsewhere specified" because of failure to conform to either spirit strength or ester content. One sample of rum was found to contain excessive copper and hence prohibition of importation of this was recommended. Two samples of brandy were also found to contain the maximum permitted amount of copper and the importers were notified by letter.

*Samsoo*

The number of samsoo samples received was slightly less than that of the previous year (2,761 as compared with 2,950 for last year). Approximately 29 per cent were from local distilleries.

Accuracy in analysis was particularly vital as very often the duty on gallons of liquor was based on the results of analysis of a single sample. The accuracy of analysis was reflected in the results of analysis of check samples submitted monthly.

*Denaturation*

The number of samples of alcohol denatured during the year on behalf of commercial firms was almost the same as that for previous year (245 as compared with 244 for the previous year). Apart from five drums which were denatured with one per cent kerosene and 1/6 per cent pyridine all the other samples were denatured with denaturants such as essential oil, dimethylphthallate, tobacco dust, and methyl alcohol.

Twelve samples were denatured in accordance with Federation of Malaya requirements, i.e. two per cent essential oil, one per cent dimethylphthallate, and five per cent methyl alcohol.

*Methylated Spirits and Other Denatured Alcohol*

A total of 729 samples of methylated spirits and denatured alcohols were analysed during the year. These samples were all denatured before being imported into Singapore. Samples were taken from every consignment on arrival to ensure that they were adequately methylated or denatured in accordance with local regulations.

All the samples were accepted as adequately denatured since they were found to contain either one per cent kerosene together with one-sixth per cent pyridine, or five per cent methyl alcohol, or one per cent dimethylphthallate.



*Toddy*

The number of toddy samples received this year showed a decrease of 112 (417 as compared with 305 for last year). These routine samples were submitted for the purpose of checking on the quality of toddy sold in the toddy shops of Singapore. The standard of the samples remained high, 81 per cent of them being classified as good and only less than one per cent of them being classified as bad due to added water or overfermentation or both.

*Duty Category Investigations*

There was a very marked increase in the number of samples received for the year under the above heading. A total of 865 samples were reported on as compared with 168 for the previous year. The large increase was due greatly to the extension of the Customs Duties Order to include many items which had previously been non-dutiable.

The samples in this section could be divided into three groups. Detergents and cleansing preparations were analysed in relation to the Customs (Protective Duties) Order, 1960, which levies duties on soap (except toilet and abrasive soaps) and preparations containing soap. Paints and paint materials were examined in relation to The Customs (Protective Duties) Order, 1962 which levies duties on prepared paints, varnishes other than nitrocellulose varnishes and insulating varnishes, distempers and water paints other than cement based paints. In addition raw materials for paint manufacture were analysed and classified either as dutiable or non-dutiable items in accordance with the recommendations of the *ad hoc* Committee on paints. The third and relatively new group of samples comprised the new items introduced into The Customs Duties Order, 1964. As a result of this order sugar and sugar-containing products, flavouring concentrates, cocoa-containing products, marble chips, greases and waxes, etc. which had hitherto been non-dutiable were now sent in for analyses and classification and ultimate assessment of duty by the Customs Department.

The number of samples of detergents and cleansing preparations, namely 214, received was slightly more than double that for the previous year, namely 96. Fifty-five of the samples analysed were found to contain soap.

Samples of paints and paint materials totalled 215 as compared with 53 for the previous year. Of this number 60 samples were resins, tested for viscosity, and 85 were thinners, analysed to determine whether they were petroleum products or not. Other samples included driers, pigments, solvents, paint removers and drying oils.

Sugars, tested for degree of polarisation, and flavouring essences were the two major items analysed.

Among the samples under "Duty Category Investigation" were 159 samples of beverages, which were found to contain less than two per cent Proof Spirit and therefore classified as "Not Intoxicating Liquor". There was one sample which was found to contain 17.1 per cent Proof Spirit, but recommendation for exemption from duty was made as it was used for medicinal purposes.

REVENUE SECTION  
DISTRIBUTION OF WORK 1964

Class of Work				SOURCE		
				Customs	Non-Official	Total Samples
Denaturation of Spirit	..	..	..	..	245	245
Liquors:						
Beer, Cider and Stout	..	..	..	717	..	717
Brandy	..	..	..	271	2	273
Whisky, Rum and Gin	..	..	..	362	1	363
Wine, Bitters and Liquers		..	..	892	..	892
Miscellaneous	..	..	..	305	2	307
Samsoo	..	..	..	2,761	..	2,761
Toddy	..	..	..	305	..	305
Methylated Spirit, etc.	..	..	..	729	..	729
Duty Category Investigations	..	..	..	865	..	865
Total				7,207	250	7,457

TOXICOLOGY SECTION

The table below indicates the number of cases and samples for this year and last year.

NUMBER OF CASES AND SAMPLES

Type of Cases	No. of Cases		No. of Samples	
	1963	1964	1963	1964
Poisoning	693	596	1,128	981
Clinical (for opium, metals, etc.)	—	—	575	488
Alcohol (in urine, blood, etc.)	289	241	469	395
	982	837	2,172	1,864



*Poisoning Cases*

There was a decrease in the number of cases and samples when compared with those for 1963. Autopsy cases amounted to nearly 15 per cent of the total number of cases.

Table 156 shows the diversity of substances found and the number of cases of each.

There were some food poisoning cases, most of which were probably due to bacteria rather than chemical poisons. On three occasions, exhibits such as cooked ham, bread, coffee powder, grapes and ice water were also submitted for metallic contamination but no significant quantity of the common heavy metals were detected in any of them.

An interesting case of food poisoning was in connection with a number of persons who vomitted after eating *nasi lemak*. The police seized the goods from the vendor and also submitted samples of the *nasi lemak* together with ingredients used in the preparation such as coconut milk and fried fish. On analysis the presence of arsenic in the *nasi lemak* and coconut milk was established. The contents of one of the packets of the *nasi lemak* weighing about 255 grammes was found to contain about 10 milligrammes of arsenic. Specimens of stomach washout and urine of the affected people, submitted by the hospitals, were also analysed and all of them were found to contain arsenic. The urine of one patient was found to contain as high as 5 milligrammes of arsenic per litre. Fortunately there was no fatal case.

The number of sodium hydroxide poisoning cases remained about the same as that for last year (28 as compared with 26 for last year). Almost invariably the taking of caustic soda was with suicidal intent and of the 28 cases encountered, there were 11 deaths. Those who survived presumably had no idea of the damage and agony that were to follow after the ingestion of such corrosive alkali.

As might be expected, household commodities were frequently met with in suicide or accidental poisoning cases. These included synthetic detergents, soap, calamine lotions, lime, bleaching solutions, essential oils, etc., with detergent and kerosene topping the list. In some instances, the accidental ingestions were by small children. However the majority of the cases were not fatal. In a few cases, ingestions of methyl salicylate have resulted in deaths.

On such mishap concerned a three year old girl who was given a tablespoon full of cinnamon oil instead of cough mixture by her mother. On realising the error the child was immediately sent to hospital where she died the following day. Oil of winter-green (methyl salicylate) was detected in the specimen of stomach washout. The bottle labelled "Pure Cinnamon Oil", which was submitted by the Police, was found to contain approximately 89 per cent of methyl salicylate.

The number of exhibits (as opposed to specimens) submitted by the Police and the Hospital was about the same as that for last year. These exhibits very often gave valuable clues to the Chemist as to what to look for in

the hospital specimens. The labels on the exhibits were extremely helpful and the poisons, if any, present in them were purer and easier to manipulate than the poisons present in the specimens from the victims. The exhibits included pills, tablets, or mixtures. Among the substances encountered were chloramphenicol, digoxin, marplan, probanthine, warfarin etc. Many of the exhibits were mixtures and in one particular type of tablets, five substances were detected, namely amidopyrine, dipyrrone, phenobarbitone, papaverine and homatropine.

Among the Chinese, the use of Chinese medicines for various ailments is a traditional practice. On occasions excessive lead and arsenic were found in the medicines. In one case a baby developed cyanosis of the extremities after taking a brown powder containing 1,000 parts per million of lead and 80 parts per million of arsenic. In another case a brown powder for use externally was found to contain 12,000 parts per million of lead.

Insecticides such as DDT, gammaxene, diazinon and malathion were frequently encountered. Among the six fatal cases, four were due to malathion, one was due to DDT and gammaxene and the other gammaxene alone. Two of the fatal cases due to malathion were from Kuching while the one due to gammaxene was from Jesselton. In most of the cases, large quantities of the insecticides were isolated from the stomachs.

Cases due to overdose of depressant drugs such as the hypnotics and sedative were many with the barbiturates heading the list.

In a fatal suicide attempt by a teenage girl, fragments of amytal tablet were recovered from the stomach. The stomach and contents was also found to contain four grammes of amytal.

Among the non-barbiturate sedative class, there were three cases of gluthethimide (doriden) and three cases of methaqualone (melsedin), but only one was fatal. There was also one death arising from ingestion of tranquilizer meproamate. Slightly more than two grammes of meproamate were found in the stomach and contents.

Cases of poisoning due to narcotics included opium, morphine and codeine. In one case a seaman, a drug addict, was found dead in his cabin and beside him was a hypodermic needle and a few packets of white powder suspected to be morphine. Analysis of the exhibits as well as the organs of the deceased revealed the presence of morphine and the amount found in the liver was 0.14 milligrammes morphine per 100 grammes liver.

Cases from Sabah, Sarawak and Brunei numbered 19 as compared with 12 for last year. Of these, four were veterinary cases involving two racing ponies, a dog and a goat.

In one case from Kuching, a housewife admitted having placed in a cup of tea meant for her husband some ash from the web of a gas-lamp. The keen-eyed husband, on observing what took place, refused to drink the tea but instead brought it to the local Police. The tea was found to contain traces of thorium, which is used in the manufacture of gas mantles,



*Blood, Urine, etc. for Alcohol*

The number of cases and specimens this year showed a decreased (241 cases involving 395 specimens as compared with 289 cases involving 469 specimens. Among the specimen were 220 blood, 150 urine and 25 other specimens such as vomits or stomach washout. Of the 241 cases, no alcohol was detected in slightly over a quarter of the cases while post-mortem cases accounted for about one-third. The majority of the cases were in connection with simple drunkenness of traffic accidents.

In 13 cases the blood specimens were found to be clotted and thus no quantitative analysis was done as no reliable result could be expected from a clotted specimen. This was regrettable since the amount of alcohol in the blood in such cases might be of value in court proceedings.

Besides the specimens from the local hospital, eight specimens were also received from Sabah, three specimens from the British Forces and two from a local private dispensary. In the latter case the person affected wanted his own doctor to take samples of his blood and urine.

*Clinical Specimens*

The 488 specimens analysed under this heading were made up of the following:

Opium alkaloids	...	57
Lead	...	55
Lead and Arsenic	...	5
Arsenic	...	7
Fluorine	...	364
		<hr/> 488 <hr/>

The majority of the specimens were urine specimens. Those for fluorine content were check samples taken from workers engaged in the treatment works of the Water Department, Public Utilities Board.

The number of samples submitted by the Opium Treatment Centre and the General Hospital for opium alkaloids was approximately half of that for previous year. Over the past few years, the number of these samples has been steadily decreasing and could possibly indicate the decreasing number of opium addicts. Approximately 61 per cent of the 57 specimens were found to contain both morphine and codeine. In six instances morphine only was detected.

In one case, a patient, a former morphine addict, was suspected of taking opium although he claimed to have not taken any. Analysis of his urine revealed the presence of codeine only thus supporting his claim. The patient had in all probability, taken compounds containing codeine.

Specimens for suspected arsenic poisoning included urine, hair and nail clippings. In one case, although no arsenic was detected in the nail clippings, 4.2 per cent arsenic was found in the Chinese medicinal pills,

Table 156

## SUBSTANCES FOUND AND THE NUMBER OF CASES

A.P.C.	...	10	Melsedin	...	2
Acriflavine, Codeine	...	1	Melsedin, Morphine, Codeine	...	1
Amytal	...	12	Meprobamate	...	1
Amytal, Alcohol	...	1	Meprobamate, Soneryl	...	1
Amytal, Phenobarbitone	...	1	Mepyramine	...	1
Codeine	...	1	Mercuric Sulphide	...	1
Amytal, Phenothiazine	...	1	Methyl Salicylate	...	7
Compound	...	1	Methyl Salicylate, Turpentine	...	1
Amytal, Soneryl	...	1	Methylene Blue, Azine Dyestuff	...	1
Amphetamine	...	1	Morphine	...	2
Antihistamine	...	2	Morphine, Codeine	...	3
Antipyrine	...	1	Morphine, Codeine, Alcohol	...	1
Arsenic	...	12	Napththalene	...	1
Arsenic, Lead	...	1	Opium	...	19
Aspirin	...	1	Opium, Alcohol	...	1
Barbiturates	...	36	Paracetamol	...	1
Barbiturates, Phenothiazine	...	2	Peppermint	...	1
Compound	...	4	Phenacetin	...	3
Bleaching Solutions	...	3	Phenacetin, Barbiturate	...	2
Calamine	...	3	Phenacetin, Barbiturate,	...	1
Calcium Carbonate	...	1	Codeine	...	2
Camphor	...	1	Phenergan	...	4
Carbon Monoxide	...	1	Phenobarbitone	...	1
Carbutamide	...	1	Phenolphthalein	...	8
Chloramphenicol Palmitate,	...	1	Phenothiazine Compound	...	1
Aspirin, Tetracycline	...	3	Phenytoin, Phenobarbitone	...	1
Codeine	...	1	Potassium Permanganate	...	1
Codeine, Phenacetin	...	1	Quinine	...	2
Codeine, Salicylic Acid	...	1	Quinalbarbitone	...	1
Copper	...	1	Quinalbarbitone, Soneryl,	...	1
Cresols	...	1	Phenergan	...	1
D.D.T.	...	5	Reserpine, Sparine	...	1
D.D.T., Gammexane	...	2	Salicylic Acid	...	12
Dapsone	...	1	Salicylic Acid,	...	1
Dettol	...	4	Alcohol Methanol	...	1
Dettol, Methyl Salicylate	...	19	Salicylic Acid, Phenacetin,	...	1
Detergent	...	1	Codeine	...	1
Diazinon	...	1	Salicylate, Barbiturate	...	2
Dipyrone, Amidopyrine,	...	1	Saridon	...	2
Phenobarbitone, Papaverine,	...	3	Soap	...	3
Homatropine	...	2	Sodium Carbonate	...	1
Doriden	...	2	Sodium Chloride	...	28
Dormwell (Dichloralphenazone)	...	2	Sodium Hydroxide	...	1
Ephedrine	...	14	Sodium Hydroxide, Detergent	...	4
Ethyl Alcohol	...	3	Soneryl	...	1
Eucalyptus Oil	...	3	Soneryl, Alcohol	...	1
Flavines	...	1	Soneryl, Phenobarbitone	...	1
Gammexane	...	1	Sulphadiazine	...	1
Hair Lotion	...	1	Sulphanilamide	...	2
Hyoscine	...	1	Sulphapyridine	...	1
Isoprenaline	...	14	Sulphathiazole	...	3
Kerosene	...	6	Sulphuric Acid	...	1
Largactil	...	2	Tetracycline	...	1
Lead	...	1	Theophylline, Phenobarbitone,	...	1
Lead, Aluminium,	...	1	Ephedrine	...	1
Methylene Blue	...	1	Thorium	...	1
Lead, Camphor	...	2	Trisulphonamide, Largactil,	...	1
Lysol	...	6	A.P.C.	...	1
Malathion	...	1	Tuba Root Resins	...	4
Marplan, Amytal,	...	1	Turpentine	...	1
Prochlorperazine	...	246	Zinc, Silica	...	1
Nil	...				



DISTRIBUTION OF WORK 1964

Class of Work	SOURCE						
	Medical	Police	Water Department	Other Departments	Non-Official	Total Samples	Total Cases
Clinical Specimens ..	120	..	364	..	4	488	..
Blood, Urine etc. for Alcohol ..	382	..	..	..	13	395	241
Poison Cases:							
Exhibits ..	74	58	..	4	19	155	} 596
Specimens ..	762	..	..	3	61	826	
Total ..	1,338	58	364	7	97	1,264	837

DANGEROUS AND HAZARDOUS MATERIALS SECTION

This section continued to give advice to the Port of Singapore Authority (previously called the Singapore Harbour Board) regarding classification of dangerous goods and answer various queries concerning chemicals.

Early this year a long list of dangerous goods was submitted by the Port of Singapore Authority for amendments and our advice on the classification. Many of the items in the list required a lot of searching of reference books in order to ascertain their properties including flash points. This was time consuming. For a number of items because of insufficient information or no reference in the literature available in the Department classification was not possible. Many items in the list appeared to be non-dangerous from the point of view of the Regulation of the Port of Singapore Authority. As it would be inappropriate to include these items in the list of dangerous goods, it was suggested that these items be placed in a separate informal list for their reference.

*Explosives*

Three inspections of blasting explosives, detonators and fuses to be landed in Singapore were carried out on board the ships. Where no inspection was made samples of explosives were forwarded to the Department for testing. Seventy-one samples of industrial explosives were tested in the laboratory for stability and freedom from exudation of liquid nitroglycerine. Sixteen of these samples were from consignments for Port Swettenham and were tested on behalf of the Department of Chemistry, Kuala Lumpur. All were found fit for importation.

A total of 145 "Form H" certificates were issued to the Police Licensing Officer. The Licensing Officer would then permit the landing of explosives into Singapore or in the case of transit cargoes the off-loading of the explosives into lighters at the Eastern Explosives Anchorage pending re-loading onto the same vessel or other vessels.

The total number of samples of fireworks examined for the Police was 46 as compared with 86 for last year. The decrease in samples was because only samples from actual consignments were submitted by the Police. Previously trade samples were also submitted by the Police to see whether they were of the prohibited type. For such trade samples, the firms should be able to obtain a confirmation either from the manufacturer or seller that they did not contain prohibited ingredients. These samples were now to be treated as commercial samples and if the firms wished to ascertain that they were not of the prohibited type, the samples could be sent for analysis by the firms for which fees would be charged.

Under the Arms and Explosives Ordinance the importation, manufacture or possession of any firework composition or manufactured fireworks containing a chlorate or phosphorus or picric acid or any picrate, or of any manufactured firework containing more than one-fifth of an ounce of explosives composition is prohibited. The prohibition, however, does not apply to amorces (caps or igniting tapes for toy pistols) or signals for use by ships or aircraft or to Christmas crackers or bob-bon crackers or the snaps therefor or where used solely as a friction primer composition. Of the 46 samples examined only one was found to be of the prohibited type.

In one case from the Customs and Excise Department all three samples of fireworks were found to contain the prohibited ingredients, phosphorus and chlorate. One of the samples being firing tape does not come under the imposed prohibition. The other two samples consisted of a string with either a paper cylinder or four separate paper cylinders attached to it. When the strings were pulled the paper cylinders exploded.

Out of the five samples of fireworks examined for commercial firms, three were found to be of the prohibited type. Two samples of fireworks examined for the Chief Fire Officer were found to be of the prohibited type. One sample submitted by a technical school was found to contain the legally allowed gunpowder.

### *Magazines*

It was agreed with the Police that annual routine inspection of existing magazines for the purpose of renewal of licences could be carried out by Police Officers except in doubtful cases when the assistance of this Department was required. However, in the case of inspection of new magazines or choice of site for a new magazine, officer of the Department of Chemistry would inspect and advise. The Police was given a copy of instructions concerning explosives magazine and so long as the magazines were maintained in accordance with the instructions, licences could be renewed.



On behalf of the Police three inspections of explosives magazines were carried out. An old existing explosives magazine unused for about 15 years was found to be unfavourably sited from the safety point of view. A new site was chosen for the construction of a new magazine to replace the old one. The new magazine was consequently erected at the chosen site.

### *Petroleum*

The total number of samples tested for flash points was 702 showing an increase when compared with 499 samples for 1963. The 702 samples comprised 237 samples of kerosene, 425 samples of aviation turbine fuel and 40 samples of other type. The main increase in sample was from aviation turbine fuel as 271 samples were received last year.

### *Ship Inspections*

A total of 740 ship inspections were carried out for this year as compared with 824 ship inspections for last year. Under the Petroleum Ordinance, any ship which has carried dangerous petroleum has to be inspected and certified "gas free" of inflammable vapour before coming to dock or wharfs for repairs. In 27 of these inspections, the ships were found to be not "gas free" and had to be further cleaned and re-inspected. Fifty-one of the inspections were in connection with certifying of spaces such as double bottom tanks, settling tanks, bunkers, etc. for freedom from petroleum vapour in toxic amount prior to entry by workmen at the requests of shipping firms or dockyards.

In eighteen instances, Inspectors under the Petroleum Ordinance proceeded for inspection but owing to non-arrival or late arrival of the vessels no inspection was possible.

### *Trade Effluent*

With the setting up of more and more new industries in the State of Singapore, the number of trade effluents examined has increased as envisaged. Further increase is to be expected in the years to come.

Altogether 25 samples of trade effluent were analysed as compared with four in 1964. Ten samples of trade effluents were taken from various factories by Health Inspectors and submitted for analysis as to their suitability for discharge. Of these ten samples, only one was found to be of a fairly good standard and suitable for discharge. Analytical results of the other samples indicated the need to treat the effluents before discharge in order to obviate pollution.

In one factory the effluent was treated by filtration before discharge. However analytical results of the treated final effluent were still unsatisfactory indicating the filtration plant was not functioning properly.

Of the 15 non-official samples, 12 were submitted by the Royal Air Force, Seletar and were from a plating shop. These were analysed for pH and cyanide content. The concentration of cyanide in these samples was found to vary from 0.04 to 6.3 parts per million. The other three samples were from a commercial firm.

*Inspection and Dangerous Occurrences*

At the request of the Police a scene of explosion at a refrigeration company was visited. Six cylinders were found lying on the five-foot way of the above premises, one of which appeared to have exploded through its side. The atmosphere around the exploded cylinder was tested and ammonia was detected. This would indicate that the cylinder which has exploded contained ammonia.

Arising from complaints of excessively warm and humid atmosphere and poor ventilation of the second floor of the Ministry of Health building, the Deputy Director of Medical Services (Health) requested for a survey of the office. Measurements of temperature, relative humidity, cooling power and air velocity were made at five locations over a period of about a month and a report submitted.

With more and more developments and industrialisation in Singapore, high explosives were increasingly being used for blasting purposes. Before any blasting operation could be carried out permission from the Police had to be obtained. At the request of the Police, five blasting sites were inspected and advice given to the Police. When the neighbourhood of the blasting site was found to be uninhabited, there was no objection to the use of explosives for blasting if the usual conditions were imposed. In two cases, however, the boulders to be broken up were near buildings and road. In order to prevent any damage caused by flying debris, advice were given that the boulders should be covered with wire netting and sandbags and the minimum amount of explosives necessary should be used. The measures adopted proved to be effective.

## DANGEROUS AND HAZARDOUS MATERIALS SECTION

## DISTRIBUTION OF WORK 1964

Class of Work	SOURCE							Total Cases
	Customs	Medical	Police	Public Works Department	Other Departments	Non-Official	Total Samples	
Explosives:								
Inspection .. ..	..	..	145	..	..	..	145	..
Industrial .. ..	..	..	..	..	..	71	71	..
Fireworks .. ..	3	..	46	..	3	5	57	2
Magazines .. ..	..	..	3	..	..	..	3	..
Petroleum Ordinance:								
Flash-point Test ..	..	..	..	..	..	702	702	..
Ship Inspection ..	..	..	..	..	..	740	740	..
Trade Effluents ..	..	10	..	..	..	15	25	..
Inspection and Dangerous Occurrences .. ..	..	1	5	..	..	..	6	..
Total ..	3	11	199	..	3	1,533	1,749	2



TOTAL SAMPLES ANALYSED BY THE DEPARTMENT OF CHEMISTRY AND THE CITY ANALYST'S DEPARTMENT

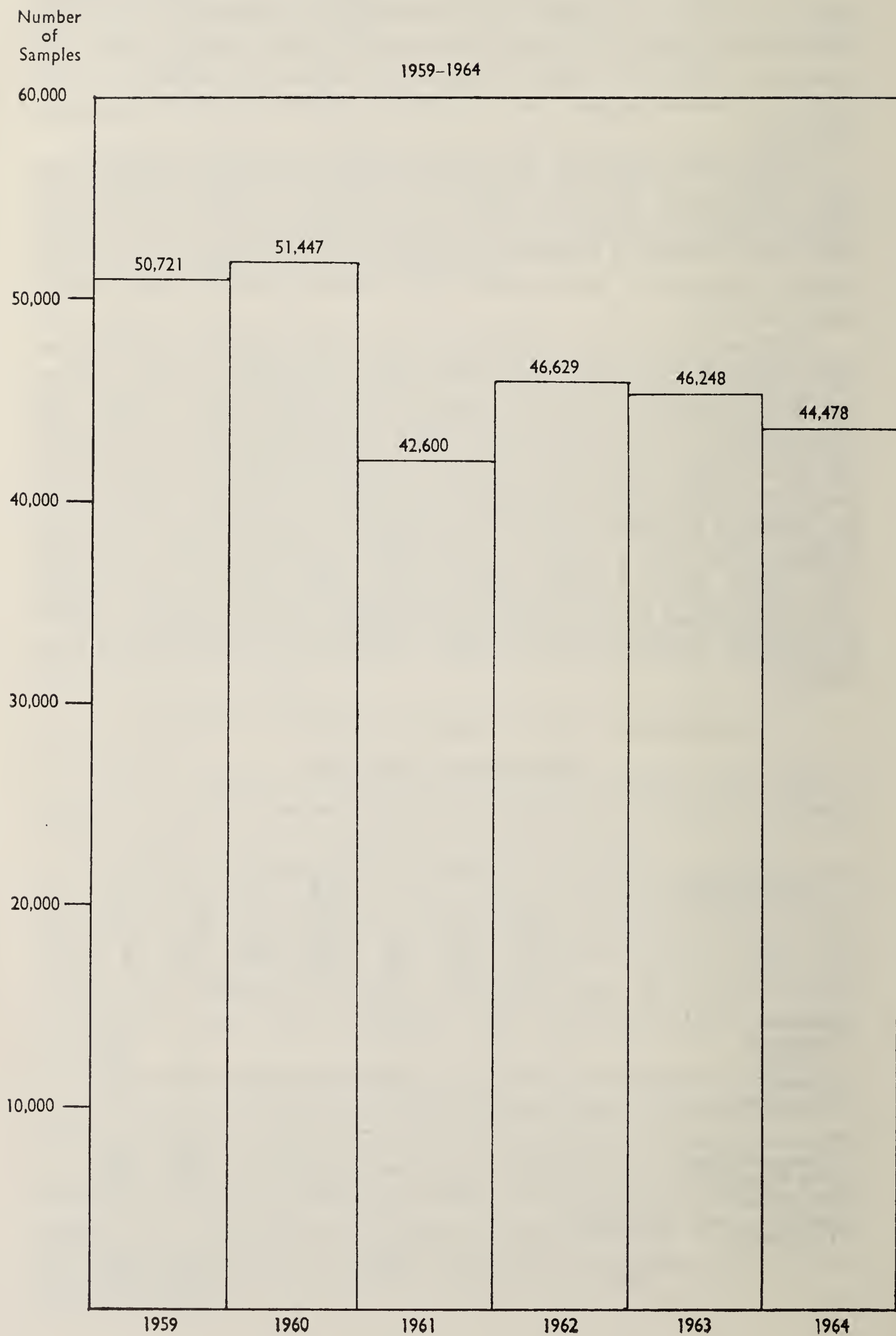


Table 157

## STAFF LIST

DEPARTMENT OF CHEMISTRY AND INSPECTORATE OF  
DANGEROUS MATERIALS

Chief Chemist and Chief Inspector of Dangerous Materials

Chia Chwee Leong, B.Sc. (Hons.), M.Sc., F.R.I.C.

Deputy Chief Chemist and Deputy Chief Inspector of Dangerous Materials

Chia Hong Hoe, B.Sc. (Hons.), M.Sc., D.I.C., A.R.I.C.

Senior Chemist and Senior Inspector of Dangerous Materials

Lim Chin Hua, B.Sc. (Hons.), D.I.C., A.R.I.C.

Chemists and Inspectors of Dangerous Materials

Phang Sing Eng, B.Sc. (Hons.), M.Sc., A.R.I.C.

Tan Jake Meng, B.Sc. (Hons.), Dip. Chem. Eng., A.R.I.C.

Chou Kai Chih, B.Sc. (Hons.), M.Sc., D.I.C., A.R.I.C.

M. C. Dutt, B.Sc. (Hons.), M.Sc., A.R.I.C.

Theng Chye Yam, B.A. (Mod.), M.Sc., A.R.I.C.

Lim Han Yong, B.Sc. (Hons.).

Phang Pui Yeong, B.Sc. (Hons.).

Chua Teck Hock, B.Sc. (Hons.).

Teo Teng Poh, B.Sc. (Hons.).

Ng Seng Choew, B.Sc. (Hons.).

Chia Hong Kuan, B.Sc. (Hons.).

Document Examiner

Ch'ng Beng Han, B.Sc.

Assistant Inspectors of Dangerous Materials

One Vacant (Mr. Aw Soon Cheong, B.Sc. resigned with effect from 25-12-64).

Lee Yang Hern, B.Sc. (appointed on 14-1-64).

P. C. Narendran, B.Sc. (appointed on 1-8-64).

Senior Laboratory Technicians

Chow Weng Sing.

Pwee Sye Cheow.

Laboratory Technicians — Fourteen.

Laboratory Assistants — Three.

Executive Officer

Ismail bin Ahmad.

Clerical Officers — Four.

Clerical Assistant — One.

Typists — Three.

Storeman and Packer — One.

Laboratory Attendants, Special Grade — Two.

Laboratory Attendants — Fifteen. Five Vacant.

Office Boy — One.

Watchmen — Three.

Gardener — One.

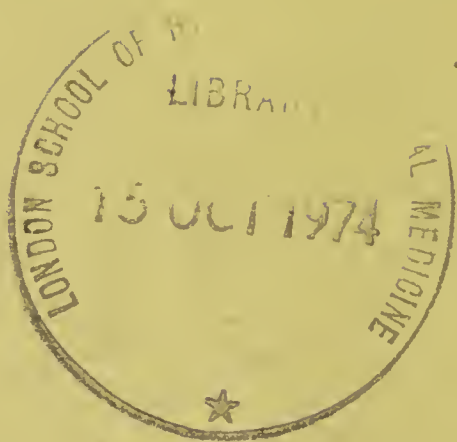


TABLE 158  
DISTRIBUTION OF LABORATORY WORK

Sections	SOURCE									
	Customs Department	Medical Department	Police Force	Water Department	Public Works Department	Parks and Recreation Division	Other Departments	Non-Official	Total Samples	Total Cases
Forensic	275	15	2,505	..	..	..	101	169	3,065	660
Health	149	2,253	..	..	..	..	2	66	2,470	952
Water and Sewage	..	107	..	18,901	3,109	3,953	..	479	26,549	..
Miscellaneous	3	20	2	93	59	..	1,095	68	1,340	..
Revenue	7,207	..	..	..	..	..	..	250	7,457	..
Toxicology	..	1,328	58	364	..	..	7	97	1,854	837
Dangerous and Hazardous Materials	3	11	199	..	..	..	3	1,533	1,749	2
Total	7,637	3,734	2,764	19,358	3,168	3,953	1,208	2,662	44,484	2,451







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